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A History of Water Resource Activities of the United States Department of Agriculture



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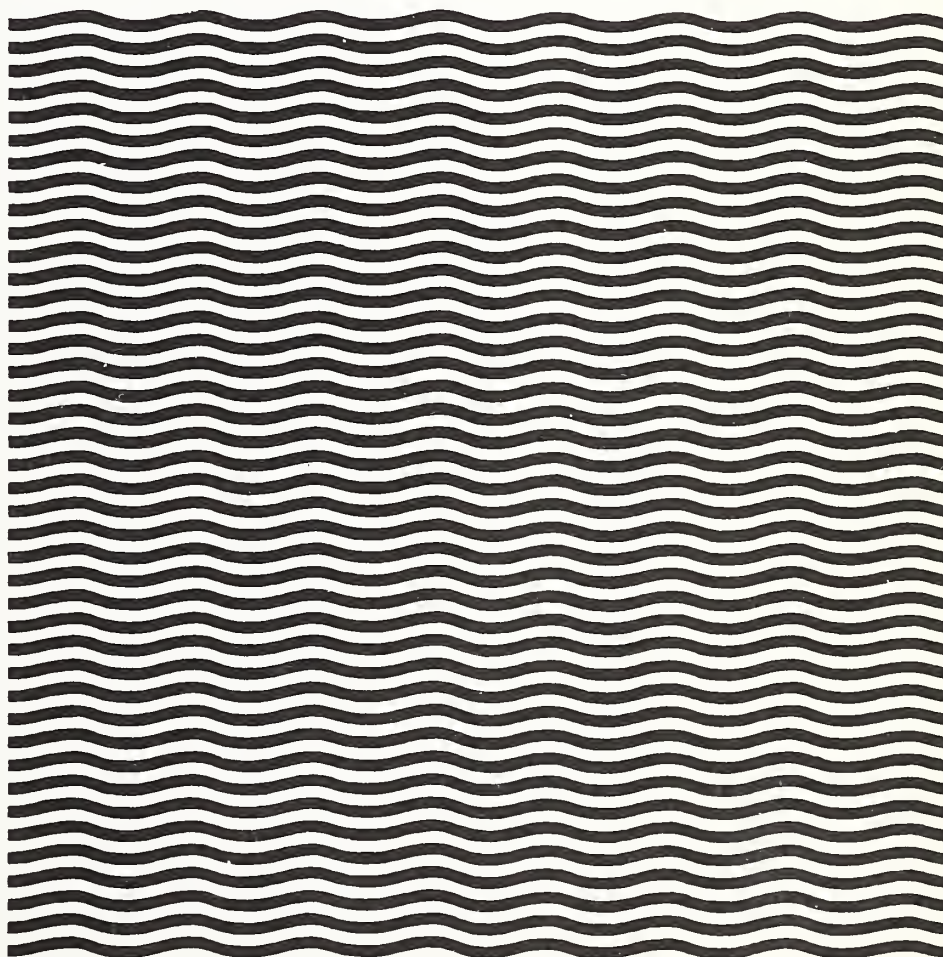
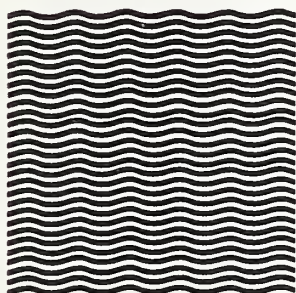
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A History of Water Resource Activities of the United States Department of Agriculture



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A HISTORY OF
UNITED STATES DEPARTMENT OF AGRICULTURE
WATER RESOURCE ACTIVITIES

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by

Eugene C. Buie . (—)

September 1979

Preface

This brief history was written to explain how and why the United States Department of Agriculture (USDA) became a participant in national water resources development programs.

USDA was engaged in water resources management studies before the close of the 19th century. With the establishment of the Soil Conservation Service in 1935 and enactment of the Flood Control Act of 1936, USDA water resources programs were enlarged significantly. The Flood Control Act of 1944 and the Watershed Protection and Flood Prevention Act of 1954 added new responsibilities and programs for water resources planning and construction of works of improvement. In recent years, USDA has been assigned numerous new water resources planning and management authorities, including an important role for implementing President Carter's water policy initiatives.

This historical record provides information for analyzing water resources programs and for shaping appropriate USDA roles in future water management efforts. Fulfilling its broad responsibilities for protection and improving natural resources and for maintaining environmental quality requires USDA's creative, positive, and direct involvement in Federal water resources policies and actions.



Joseph W. Haas
Assistant Administrator
for Water Resources

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The views expressed in this report are not necessarily the official policy of USDA.

C O N T E N T S

	PAGE
CHAPTER 1 - INTRODUCTION	1
CHAPTER 2 - PRE-WORLD WAR II ACTIVITIES	7
Soil Conservation Service	7
National Resource Planning Organizations	9
Flood Control Act of 1936	11
Flood Prevention Surveys	12
Missouri River Basin Plan	14
Water Facilities Act of 1937	15
Land Utilization and Retirement of Sub-Marginal Land Program	16
Case-Wheeler Program	16
CHAPTER 3 - POST WORLD WAR II ACTIVITIES	19
Flood Control Act of 1944	19
Pilot Watershed Projects	22
Other Activities	25
CHAPTER 4 - WATERSHED PROTECTION AND FLOOD PREVENTION PROGRAM	27
Legislation	27
Characteristics of the Program	29
Watershed Planning	31
Constraints	33
Problems	34
Moratorium	34
National Environmental Policy Act of 1969	36
The Uniform Relocation Assistance and Real Property	
Policies Act of 1970	40
Protection of Archeological and Historical Properties	40
Principles and Standards	42
Agreements Between the SCS and Corps of Engineers	42
Watershed Operations	43
Problems	47
Dams	47
Channels	48
Summary	50
CHAPTER 5 - USDA RIVER BASIN STUDIES	51
Organization	51
Washington Advisory Committee	52
Field Advisory Committees	53
Cooperative Comprehensive River Basin Studies	53
Examples	55
Corps of Engineers Sponsored	55
Joint Studies with Corps	56

Chapter 5 (continued)	Page
U.S. Study Commissions	56
Appalachia	59
Westwide Study	61
State and Local Cooperative Studies	67
CHAPTER 6 - FEDERAL INTERAGENCY RIVER BASIN STUDIES	69
Arkansas-White-Red River Basin Plan	69
Ad hoc Water Resource Council	71
Type I Surveys	72
Type II and Level B Surveys	75
CHAPTER 7 - OTHER ACTIVITIES RELATED TO THE WATERSHED PROTECTION AND FLOOD PREVENTION PROGRAMS	79
Flood Hazard Analyses	79
Flood Insurance Studies	81
Recreation and Fish and Wildlife	83
Recreation	83
Fish and Wildlife	85
Emergency Watershed Protection	88
CHAPTER 8 - OTHER WATER RESOURCE ACTIVITIES OF USDA	91
Agricultural Research Service	91
Agricultural Stabilization and Conservation Service	93
Economic Research Service	94
Farmers Home Administration	95
Forest Service	96
Rural Electrification Service	99
Soil Conservation Service	100
CHAPTER 9 - INTERAGENCY COORDINATION	105
The Federal Interagency River Basin Committee (FIARBC)	105
Official Study Commissions	106
First Hoover Commission	106
The President's Water Resources Policy Commission, 1950	106
Subcommittee to Study Civil Works of House Committee on Public Works	107
Second Hoover Commission	107
Presidential Advisory Committee on Water Resources Policy	108
Senate Select Committee on Water Resources	109
Interagency Committee on Water Resources (ICWR)	109
Coordination of Project Evaluation	110
Bureau of the Budget Circular A-47	110
Proposed Practices for Economic Analysis of River Basin Projects	110
Senate Document 97	111

Chapter	Page
CHAPTER 10 - THE WATER RESOURCES PLANNING ACT OF 1965	113
The Water Resources Council	113
River Basin Commissions	115
The National Assessment	116
Development of Water Resource Plans	118
Grants to the States	119
Principles and Standards	119
National Water Commission Report	122
National Conference on Water	122
Section 80(c) Study	123
Water Policy Review	124
CHAPTER 11 - WATER CONSERVATION AND WATER QUALITY PROGRAMS	127
Colorado River Basin Salinity Control Act	127
Memorandum of Agreement for Title I	128
Memorandum of Agreement for Title II	129
Interagency Study on Irrigation Efficiencies	131
Rural Clean Water Program	132
CHAPTER 12 - SUMMARY	135
REFERENCES	141
BIBLIOGRAPHY	154

CHAPTER 1

INTRODUCTION

On May 15, 1862, President Lincoln signed into law an Act of Congress establishing "at the seat of the Government of the United States a Department of Agriculture, the general design and duties of which shall be to acquire and diffuse among the people of the United States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word, and to procure, propagate, and distribute among the people new and valuable seeds and plants." (1) This Act was the culmination of efforts and recommendations made over a period of many years.

George Washington's Mount Vernon estate was probably the nation's first experimental farm. In his last annual Message to Congress in 1796, he proposed that a Board of Agriculture be established to collect results of experiments and observation and to pass this information on to appropriate officials in the States. (2) In 1820, the House of Representatives established an agricultural committee and the Senate established one in 1825. In 1852 the United States Agricultural Society was formed. It was primarily a pressure group to direct official interest to the agricultural needs of the time. Many of its members were prominent and the Society insisted that a national Department of Agriculture be established. (3) In 1860, the Maryland Agricultural Society endorsed the establishment of a Bureau of Agriculture in the Department of the Interior. (4) The Massachusetts Board of Agriculture also worked to this end. (5)

Isaac Newton took the oath of office as first Commissioner of Agriculture on July 1, 1862. He inherited a staff of nine employees and the facilities of the Agricultural Division of the Patent Office. Advocates of the Department considered agriculture the single most important economic activity in the nation and urged that it be made an Executive Department, headed by a Secretary who would be a member of the President's Cabinet. It was not until 1889, however, that the Department was elevated to Cabinet status. (6)

In 1879, James Wilson of Iowa was appointed Secretary of Agriculture. He served sixteen years and set guidelines that made the Department an outstanding research organization. It established experimental farms and laboratories in various parts of the country to work on specific agricultural problems. However, most experimental work was carried out in state agricultural experiment stations. These had been established on a nationwide basis by the Hatch Act, passed in 1887. In 1889 the Department began issuing farmers' bulletins as a means of diffusing among the people of the United States information about scientific developments in the field of agriculture. (7)

To adapt research results to local conditions, the first county agent was appointed in 1906 to do something about boll weevils in Texas.

Later, other agents were appointed in the South and elsewhere. In 1914 this system was extended throughout the nation with the passage of the Smith-Lever Act. (8)

In 1889, the Weather Bureau was transferred from the War Department to the Department of Agriculture. An Appropriation Act of March, 1889, (30 Stat. L., 947, 952) made a specific appropriation of \$10,000 "to enable the Secretary of Agriculture to map the tobacco soils of the United States." This was the beginning of the Soil Survey. The Weather Bureau initiated USDA's work on soils in 1892 by publishing a report on the "Relation of Soil to Climate" and a bulletin on "Some Physical Properties of Soils in Their Relation to Moisture and Crop Distribution". This bulletin was authored by Milton Whitney in cooperation with the Maryland Experiment Station and USDA. (9) This probably was the first effort to establish scientifically a relationship between soil and water in the area of crop production which would later become such a major part of the Department's program.

On January 2, 1894, the Division of Agricultural Soils was organized in the Weather Bureau by order of the Secretary of Agriculture. Charles Dabney, Jr., Assistant Secretary of Agriculture, insisted upon the publication of Farmers Bulletin No. 20, "Washed Soils; How to Prevent and Reclaim Them", now considered a milestone in soil conservation. (10)

Agricultural engineering activities have been a subject of research in USDA since 1890. The first engineering studies dealt with irrigation of agricultural crops. Irrigation investigations were authorized by Congress in 1898. This resulted in the establishment of a Division of Irrigation in the Office of Experiment Stations. Its initial objective was to determine the best locations for artesian wells. Research on drainage became an added responsibility of this office in 1902. (11) In 1905, investigations in irrigation began under the Office of Western Agricultural Extension at the request of the Bureau of Reclamation.

In 1915, the work on irrigation and drainage was transferred to USDA's former Office of Public Roads, which was renamed Office of Public Roads and Rural Engineering. In 1921, all work in rural engineering was incorporated in the Division of Agricultural Engineering in the recently created Bureau of Public Roads. On July 1, 1931, the Division of Agricultural Engineering was raised to Bureau status. It continued its concern with irrigation and drainage. (12) On December 3, 1938, the Secretary of Agriculture, by Memorandum 799, transferred certain functions of the Bureau of Agricultural Engineering to the Soil Conservation Service. He designated H. H. Bennett, Chief of SCS, to have charge of that part of the work of the Divisions of Irrigation and Drainage which related to investigations, experiments and demonstrations on the construction and hydrologic phases of farm irrigation and land drainage, including snow-survey responsibilities. This transfer of authority was effective January 2, 1939. (13)

The Division of Dryland Agriculture was organized in the Bureau of Plant Industry in 1905, to investigate methods of crop production

under limited moisture supplies and semi-arid conditions. This same year the states in the Great Plains began to establish permanent substations to study dryland problems. Twenty-two substations were established between 1905 and 1916. One more was established in 1937. These were distributed among ten states as follows: Colorado - 1, Kansas - 3, Montana - 3, North Dakota - 4, Nebraska - 2, New Mexico - 1, Oklahoma - 2, South Dakota - 2, Texas - 3, and Wyoming - 2. (14)

On March 1, 1911, The Weeks Act (36 Stat. 961) was passed. It authorized the Secretary of Agriculture to "Examine, locate and recommend for purchase . . . such lands within the watersheds of navigable streams as . . . may be necessary to the regulation of flow of navigable streams...." The Act further states that lands so acquired will be reserved and administered as national forests. Prior to this time, on February 1, 1905, control over the forest reserves had been transferred from the Land Office of the Department of the Interior to the Department of Agriculture. Responsibility for these lands was given to Chief Forester Gifford Pinchot. With these lands he inherited the power to issue permits for water power development on National Forest Lands. (15)(15a)

In 1920 the Federal Power Commission was formed as a Cabinet-level committee of the Departments of War, the Interior, and Agriculture. The 1920 Federal Water Power Act authorized the committee to license non-Federal development of water power on navigable waters and public lands. (16) Forest Service engineers conducted water resource feasibility studies which became the basis for many of the major projects built in the 1920-1945 period. (Field engineering for the Commission continued to be accomplished for projects on National Forest lands by engineers on Regional Foresters' staffs until about 1950.) Forest Service personnel made significant contributions to the draft of the bill that became the Federal Power Act. In 1930 an independent Commission was established consisting of five commissioners who are presidential appointees. (17) The Forest Service continues to have liaison responsibilities between the Department of Agriculture and the Federal Power Commission. Furthermore, pursuant to the Secretary's Statement of Organization and Delegations, November 27, 1964, (29 Federal Register 16210) the Forest Service is authorized to act for the Secretary in all matters relating to the Department's responsibilities and authorities under the Federal Power Act. (18)

On June 7, 1924, the Clarke-McNarey Act (43 Stat. 653) was passed. As amended and supplemented (16 U.S.C. 505, 564-570) it "authorizes and directs the Secretary of Agriculture, in cooperation with . . . various states. . . and other suitable agencies to recommend systems of forest fire prevention and suppression . . . with a view to the protection of forest and water resources". In cooperation with the states, due consideration was to be given to the protection of watersheds of navigable streams. However, such cooperation could be extended, at the discretion of the Secretary of Agriculture, to any timbered or forest producing lands or watersheds from which water is secured for domestic use or irrigation within the cooperative states. (19)

On May 22, 1928, the McSweeney-McNary Forest Research Act (45

Stat. 699) was passed. As amended and supplemented (16 U.S.C. 581) it "authorizes and directs the Secretary of Agriculture to conduct such investigations, experiments, and tests as he may deem necessary....in order to determine, demonstrate and promulgate the best method....of maintaining favorable conditions of water flow and the prevention of erosion". (20)

In 1925 Congress directed the Corps of Engineers and the Federal Power Commission to prepare jointly a list of navigable streams and their tributaries on which power development appeared practicable (with the exception of the Colorado River). This list was to be prepared with a view to formulating "general plans for the most effective improvement of such streams for the purposes of navigation and the prosecution of such navigation improvement in combination with development for power, flood control, and irrigation". The list of streams which resulted from this effort was submitted to Congress in 1927 and printed in House Document 308. The 1927 Rivers and Harbors Act authorized the Corps to prosecute these surveys alone. Reports prepared on these streams became known as the "308 reports". These reports were to have a significant influence in studies to be made later by the Department of Agriculture.

USDA's early research work was not limited to irrigation, drainage and soil-moisture relationships. It has been engaged in research on the hydrology of agricultural watersheds since 1917. In that year a suitable area of 112 acres situated about $4\frac{1}{2}$ miles southeast of Jackson, Madison County, Tennessee, was chosen as the site for experimentation. Nearly all the area was in a farm owned by M. N. Murchison. The experiments conducted consisted in making rainfall and run-off measurements on six watersheds ranging in area from $1\frac{1}{4}$ to 112 acres. (22)

This research provided the basic concepts and data for use of the rational method of computing the maximum rate of run-off from a watershed. The basic assumption was that the maximum rate of run-off would result from a rainfall of maximum uniform intensity continuing for a time equal to or exceeding the time of concentration of a given watershed. The relationship was expressed by the following equation:

$$Q = C I A$$

Where Q = Run-off coefficient or coefficient of imperviousness, representing the rate of run-off to the rate of rainfall.

I = Rainfall intensity in cubic feet per second per acre, or approximately in inches per hour.

A = The watershed area in acres.

This method of run-off computation supplanted the use of empirical formulae that previously had been used for computing storm run-off but did not make provision for the various factors affecting run-off. (23) It is estimated that, eventually, 150 instrumented watersheds, ranging in size from 1 to 500 acres, were utilized to collect run-off data from small agricultural areas.

On November 21, 1928, during a hearing before the Agricultural Appropriations Committee of the House of Representatives, Congressman James P. Buchanan of Texas remarked that one experiment station at Spur, Texas, had been doing valuable work on soil erosion.* He pleaded that the nation needed a general policy of soil and water conservation. After receiving data on funds needed to make a start on the problem, Congress responded by appropriating funds for soil erosion investigations and the establishment of regional soil erosion experiment stations. This action was known as the Buchanan Amendment to the Agricultural Appropriations Bill for FY 1930 (P.L. 70-769), dated February 16, 1929. Operation of these stations was assigned to the Bureau of Chemistry and Soils, in cooperation with the Forest Service and the Bureau of Agricultural Engineering, in 1931 (45 Stat. 1207). (24)

The locations selected for the Regional Soil Erosion Experiment Stations were as follows:

Batesville, Arkansas; Tifton and Watkinsville, Georgia; Dixon Springs, Joliet, and Urbana, Illinois; Lafayette, Indiana; Clarinda, Cortana, Beaconsfield, Independence, and Seymour, Iowa; Hays, Kansas; Baton Rouge, Louisiana; Presque Isle, Maine; Benton Harbor and East Lansing, Michigan; Holly Springs and State College, Mississippi; Bethany and McCredie, Missouri; Hastings, Nebraska; Bumerville, Marlboro, and New Brunswick, New Jersey; Ithaca, Geneva, and Marcellus, New York; Statesville and Raleigh, North Carolina; Coshocton and Zanesville, Ohio; Cherokee and Guthrie, Oklahoma; Clemson and Spartanburg, South Carolina; Knoxville and Greenville, Tennessee; Temple and Tyler, Texas; Blacksburg, Virginia; Pullman, Washington; LaCrosse, Madison, and Owen, Wisconsin; and Mayaguez, Puerto Rico. (25)

During the period 1862 to 1929 the Department of Agriculture had experienced a major expansion in its program activities and areas of responsibility. It had grown from one which primarily collected and dispersed seed to one which, in addition to its other duties in the field of agriculture, carried out research in irrigation, land drainage, establishing surface water run-off relationships on small agricultural areas, and determining soil moisture relationships for the production of various crops. Also, it had been given responsibility for the protection of National Forest lands for the production of run-off for navigable streams, and, together with the Departments of Army and the Interior, for licensing the use of water for the production of power.

Its areas of activities had established the fact that land and

* The author has had first-hand information and observation of the results of the diversion of excess run-off from areas off this station onto the station. The waters were spread over cropland areas by means of a syropan system and thereby provided supplemental irrigation. The principle has been utilized in the High Plains and Rolling Red Plains areas of Texas and in other areas to utilize available off-site run-off for crop production and for increased forage production on range lands.

water cannot be separated since all surface run-off is derived from the land and all fresh water recharge must pass through the soil mantle. Also, the production of all plant life is dependent on soil-moisture relationships which can be manipulated by soil and cover conditions.

The Department, therefore, had achieved a stature and scope which permitted it to fulfill the responsibilities in the field of water resource development which were to be assigned it in the decades ahead.

NOTE:

For those wishing to explore in greater depth the early history of the Department, the following books are recommended:

The Department of Agriculture, Wayne D. Rasmussen and Gladys L. Baker, Praeger Publishers, 111 Fourth Ave., New York, N. Y. 10003

After A Hundred Years, The Yearbook of Agriculture 1962, United States Government Printing Office, Washington, D. C.

A Century of Service - The first 100 Years of USDA

CHAPTER 2

PRE-WORLD WAR II ACTIVITIES

Soil Conservation Service

On August 25, 1933, the Soil Erosion Service was established as a temporary organization in the U. S. Department of the Interior. This action was taken without formal order, but was based on a resolution adopted on July 17, 1933, by a special board of public works. The new agency was to carry out the provisions of the National Industrial Recovery Act of June 16, 1933 (48 Stat. 195) relating to soil erosion prevention and to administer the expenditure of Public Works Administration Allocations for this purpose. On September 19, 1933, the Soil Erosion Service became operational with the transfer of Hugh H. Bennett from the Department of Agriculture to the Department of the Interior as its Director. (26)

All funds, personnel, property and equipment of the Soil Erosion Service were transferred to the Department of Agriculture by an Administrative Order signed by the Federal Emergency Administrator of Public Works on March 23, 1935. The order was approved by the President on March 25, 1935. Authority for this action was cited as Executive Order 6252, August 19, 1933, and Executive Order 6929, December 26, 1934. As a result of this transfer to the Department of Agriculture, the Emergency Conservation Work (ECW) camps assigned to the Forest Service for erosion control work on agricultural lands were transferred to the SES. (These camps were manned by CCC personnel.) Additional new camps also were assigned to the Service. (27)

On March 27, 1935, the Secretary of Agriculture, by Departmental Memorandum 665, directed the unification of the Department's activities pertaining to soil erosion under the Soil Erosion Service. This order transferred to the SES the erosion control experiment stations of the Bureau of Chemistry and Soils and the Bureau of Agricultural Engineering and the erosion control nurseries of the Bureau of Plant Industry. (28)

The 10 experiment stations transferred were located near Guthrie, Oklahoma; Temple, Texas; Hays, Kansas; Tyler, Texas; Bethany, Missouri; Statesville, North Carolina; Pullman, Washington; Clarinda, Iowa; La Crosse, Wisconsin; and Zanesville, Ohio. (29)

On April 27, 1935, the President approved the Soil Conservation Act of 1935 (P.L. 46-74th Cong.). It directed the Secretary of Agriculture to establish an agency to be known as the "Soil Conservation Service" to exercise the powers conferred on him by the Act. On that same day the Secretary issued Departmental Memorandum 673 establishing the Soil Conservation Service in the Department of Agriculture. It further provided that the SCS include the activities conducted under the Soil Erosion Service. (30)

By December 31, 1935, the SCS, along with its other program activities, such as demonstration projects, was operating 489 Emergency

Conservation Work Camps (Civilian Conservation Corps). These camps provided the technical assistance, manual labor, and necessary materials to install water related and other erosion control measures on privately owned lands. The measures included terraces, waterways, check dams, gully control structures, stock ponds, wind breaks, tree plantings, grass plantings, wildlife plantings, and assistance with irrigation and drainage. WPA labor crews also were utilized for this purpose in some localities. The ECW Camps continued to be utilized in this manner until the outbreak of WWII called for their disbandment.

Public Law 74-46, 49 Stat. 163, was stated in very general language and permitted a wide range of activities. In its preamble it states:

"....that it is hereby declared to be the policy of Congress to provide permanently for the control and prevention of soil erosion and thereby to preserve natural resources, control floods, prevent impairment of reservoirs, and maintain the navigability of rivers and harbors, protect public health, public lands and relieve unemployment, and the Secretary of Agriculture, from now on, shall coordinate and direct all activities with relation to soil erosion...."

This broad authority has permitted the Secretary to participate in essentially all programs related to soil and water resources, being limited only by personnel and appropriation of funds.

The SCS was staffed to include all the disciplines considered necessary to provide technical assistance to meet all the needs of a farmer or rancher in planning and applying a complete conservation program on his lands. The disciplines included: soil conservationist (an individual whose formal training and/or experience qualified him to coordinate the several disciplines required to plan and apply a complete conservation plan), soil scientist, agronomist, engineer, biologist, geologist, forester, range specialist, and plant material specialist. These disciplines were dispersed at various levels of Service organization depending upon the degree of demand for their services. The organization was such that service for each discipline could be provided at any level of Service organization.

On June 6, 1935, the Secretary of Agriculture's Committee on Soil Conservation made a recommendation, approved by the Secretary, to the effect: "That on or after July 1, 1937....all erosion-control work on private lands, including new demonstration projects, be undertaken by the Soil Conservation Service only through legally constituted Soil Conservation Associations". Out of this action, Soil Conservation Districts were born. In February 1937, the President submitted to the Governors of all States a standard State Soil Conservation Districts Law. He suggested that authority be given farmers and ranchers to organize districts specifically for conservation of soil and water resources. (31) On March 3, 1937, the first Soil Conservation Districts Law was enacted in Arkansas. (32)

Rapid action followed in other states. As early as April 24, 1941, one state, Alabama, had all its farmland included in soil conservation districts. (33) By the late 1960's there were about 3000 districts in the 50 states, Puerto Rico, and the Virgin Islands. All of these were cooperating with the SCS. (34)

Through these districts and the responsibility of SCS for the technical aspects of the ACP administered by the Agricultural Stabilization and Conservation Service, the SCS had technical relationships within almost every county of the nation. This provided the SCS with a technical delivery system to essentially every county of the U. S. This is a unique capability within the Federal Government.

National Resource Planning Organizations

There were four successive national planning organizations which operated between 1933 and 1943. They were really the same agency reorganized three times. When Congress abolished the last of the four, the National Water Resources Planning Board, in 1943, it instructed that the agency's functions not be transferred to any other agency. (35)

The National Planning Board was the first of the four. It was created in 1933 as a consequence of the National Industrial Recovery Act of 1933. The Board's chief water resources planning accomplishment was coordinating the work of the President's Committee on Water Flow. This committee's report contained multiple-purpose plans for 10 river basins. These plans were based primarily on Corps of Engineers 308 reports and Bureau of Reclamation surveys. (36)

The National Planning Board was reorganized as the National Resources Board in June 1934. It was an independent agency reporting directly to the President. In its December 1934 report it recommended that studies of water projects for adoption by Congress be prepared on the basis of drainage basins as entire units and that they consider a great variety of water and land uses and controls. It also recommended detailed engineering, economic, and legal studies of 17 drainage basins. (37)

The National Resources Board passed out of existence when title II of the NIRA expired. The National Resources Committee was established by Executive Order, under the Federal Emergency Relief Appropriations Act of 1935, to continue its work. The most important achievement of the National Resources Committee's work was a nationwide study of drainage basin problems and programs. This study was made by NRC's Water Resources Committee. (38)

The Water Resources Committee was appointed July 24, 1935. Among its members were H. H. Bennett, Chief, SCS, and J. N. Darling, Bureau of Biological Survey, USDA. Other membership came from the University of Chicago, U. S. Geological Survey, Army, New York University, Bureau of Reclamation, U. S. Public Health Service, Federal Power Commission, State

of Maryland's Department of Health, and a USDA alternate from Bureau of Agricultural Engineering. (39)

This committee was to serve as a coordinating and steering group for continuation and re-orientation of water studies under the Natural Resources Committee. Its objectives were (1) to achieve closer contact and cooperation with other Federal agencies, and (2) to achieve a necessary reduction in overhead costs of the Section. To do this it would work through other agencies and not build up a continuing committee staff. Among the subjects with which it was concerned were: Policy in regard to small water developments, and Policy on flood control projects. (40)

On October 8, 1935, the committee submitted a Report on Federal Activities Relating to Small Water Storage Projects. The following quote summarizes its findings:

"Small water storage construction programs have found wide popularity as Federal work relief during the past two years. Federal agencies had long been interested in this type of project from the standpoint of design and use for stock water supply, irrigation, flood protection, recreation, wildlife conservation, power, and erosion control, but it was not until the emergency relief program of 1933 was authorized that large scale construction became practicable. Under the Civilian Conservation Corps thousands of projects supervised by the Forest Service, Division of Grazing, Indian Office, National Park Service, and Soil Conservation Service were built on public domain and on private lands as well, and under the Federal Emergency Relief Administration many states initiated extensive small dam programs." (41)

The Report also gave a statement regarding the extent of this program. It amounted to 1,100 recreational dams, 3,600 farm ponds, 2,000 water holes, 1,150,000 erosion control dams, and 2,600 other small reservoirs. These were constructed by CCC camps during the period April 1933 to March 1935. (42)

Probably the most important achievement of the Water Resources Committee was a nationwide study of drainage basin problems and programs. It contained recommendations for both Federal and State development. It also sponsored more detailed studies on particular river basins. (43)

In 1939 the National Resources Committee was reconstituted as the National Resources Planning Board and elevated to the role of planning division of the Executive Office of the President. Among other duties, it was authorized to undertake research and analyze problems involving water and to report plans and programs to the President and Congress. (44)

In a Memorandum to the Secretary of Agriculture in November 1936, the Flood Control Committee of the Water Resources Committee stated that the comprehensive nature of the basin surveys and reports would indicate that nearly all the Bureaus of the Department would be involved. It further stated that the two most concerned would be the Forest Service

and the Soil Conservation Service. (45)

The Secretary of Agriculture established a Director of Flood Control in his office with a small staff. Its duties were defined as: establish policies and broad plans of work; allocate funds; coordinate work of the various bureaus in the field of flood control; collaborate with bureaus in preparation of reports to Congress; and to coordinate work of USDA with other Departments. (46)

The Secretary defined the duties of the three most concerned agencies as follows:

(1) The Soil Conservation Service would have responsibility for farm land, for streams the treatment of which is an integral part of farm land management, and on intermingled farm and forest land in cooperation with the Forest Service.

(2) The Forest Service would have responsibility for forest lands, for streams the treatment of which is an integral part of forest land management, and on intermingled farm and forest land in cooperation with SCS.

(3) The Bureau of Agricultural Economics would assist in the economic aspects of the surveys, either directly or through SCS-BAE liason groups, to consider social and economic aspects of various land utilization plans, and to serve as economics advisor to the Director of Flood Control. (47)

Flood Control Act of 1936

The Flood Control Act of 1936, P.L. 74-738(49 Stat. 1570) was approved June 22, 1936. The Congress, for the first time in legislative action, recognized the importance of providing watershed protection and flood prevention as a complement to the downstream flood control program of the Corps of Engineers. It, in effect, recognized that floods originate in the tributary areas of rivers and other waterways.

In Sec. 2 of the Act the Congress directed that:
"....Federal investigations of watersheds and measures for run-off and waterflow retardation and soil erosion prevention on watersheds shall be prosecuted by the Department of Agriculture under the direction of the Secretary of Agriculture, except as otherwise provided by Act of Congress;...."

This Act contained another innovation. It specified in Sec. 1:
".....that the Federal Government should improve or participate in the improvement of navigable waters or their tributaries, including watersheds thereof, for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected."

To assist in carrying out the Department of Agriculture's part of this national program, a Flood Control Coordinating Committee was

established in the Department. The SCS representative was designated as chairman. Joint responsibility for carrying out the program was delegated by the Secretary to the Soil Conservation Service, the Forest Service, and the Bureau of Agricultural Economics. (48) Preliminary examination work was begun pursuant to Field Memorandum, SCS-528, August 12, 1937. (49)

An amendment to the 1936 Flood Control Act in 1937 (Sec. 3, 50 Stat. 876, 877) extended USDA's authorization to cover the watersheds of all waterways previously authorized to be surveyed by the Corps of Engineers. (50) This meant that USDA was authorized to make studies and investigations of the watersheds of all waterways covered by the Corps' 308 Reports. Neither the 1937 nor the 1938 Flood Control Acts authorized any works of improvement. However, while 1938 legislation did give the Secretary of Agriculture general authority to improve the watersheds of waterways on which Corps of Engineers improvement works had been authorized, this authority was never used.

Flood Prevention Surveys

The Flood Control Act of 1936 was amended and supplemented by the Flood Control Acts of 1937, 1938, 1939, and 1941. These acts provided the general legislative authority for the flood control program together with USDA's authorization to make surveys on specific watersheds and to receive appropriations for making surveys and for carrying out works of improvement. (51)

The Flood Control Acts authorized the USDA to work on the same streams that Congress had authorized the Corps of Engineers to work on, with one or two exceptions. The Department thus had been authorized to make examinations and surveys on drainage basins which comprised approximately three-fourths of the total area of the United States. (52) As of January 1, 1946, the Flood Control Acts included 913 separate authorizations for USDA to make preliminary examinations and surveys of watersheds or portions of watersheds of streams. (53)

The nature of the flood control authorizations imposed upon USDA the job of trying to separate out and measure the flood control benefits that would accrue from a land conservation program involving the entire farm operation of all the farms in a watershed. (54) Flood control benefits were defined as those which would accrue off-site. Conservation benefits were defined as those which would accrue on-site, largely through increased yields and farm income. (55) This became rather critical when a limitation was placed in the Flood Control Act of 1941 restricting the use of flood control funds to those works of improvement which the Department was not authorized to undertake through other programs. (56)

During the six-year period 1937-1943, preliminary examinations were initiated on 212 watersheds and completed on 160. They covered over 1,200,000 square miles or about one-half of the total area authorized to the Corps of Engineers for preliminary examination and survey. (57)

During this same six-year period, 41 detailed surveys were initiated. Reports on 17 of these were approved by the Secretary of Agriculture prior to June 30, 1943. Fifteen of these were cleared by the Bureau of the Budget for transmittal to Congress as of September 9, 1943. The completed surveys were expected to provide excellent public works programs for the post-war period when it was expected there would be a need for work requiring a maximum of labor and a minimum of equipment. (58)

The objectives of the USDA's program were (1) to aid in reducing floodwater damages by decreasing run-off and water-flow that contribute to flood flows, and (2) to reduce sediment damage to reservoirs and flood plains by reducing or preventing erosion. Program reliance was placed in improvement of the vegetal cover. This reduced run-off by increasing infiltration rate and water storage capacity of the soil. Such mechanical measures as contour cultivation, terracing, gully control devices, debris basins, and channel stabilization devices also were employed. (59)

One particular problem brought to light by the surveys concerned the allocation of flood control benefits between upstream and down stream measures. On many watersheds the proposed works of the Corps of Engineers already had "used up" such a large proportion of the flood damage reduction benefits that the USDA program, regardless of its value, could not be justified from the flood control point of view. (60)

As of July 20, 1953, the Department of Agriculture had completed 183 preliminary examinations and had transmitted to the Congress 25 detailed survey reports pursuant to the Flood Control Acts. Of these preliminary examinations, 153 had indicated sufficient flood water and sediment damage reduction benefits to warrant the making of detailed surveys. Departmental leadership on these examinations was as follows:
SCS - 96; FS - 57. (61)

The 25 watersheds for which the detailed survey reports recommended the installation of watershed improvement programs under the Flood Control Acts and which were transmitted to Congress are: (1) Brazos, River (Tex.) (H.D. 396, 82nd Cong., 2d Sess.); (2) Buffalo, Creek (N.Y.) (H.D. 574, 78th Cong., 2d Sess.); (3) Colorado, Middle (Tex.) (H.D. 270, 78th Cong., 1st Sess.); (4) Coosa, River (Above Rome, Ga.) (Ga., Tenn.) (H.D. 236, 78th Cong., 2d Sess.); (5) Grand (Neosho) (Ark., Okla., Kans., Mo.) (H.D. 388, 82nd Cong., 1st Sess.); (6) Green, River (Ky., Tenn.) (H.D. 261, 82nd Cong., 1st Sess.); (7) Little Sioux (Iowa, Minn.) (H.D. 268, 78th Cong., 1st Sess.); (8) Little Tallahatchie (Miss.) (H.D. 892, 77th Cong., 2nd Sess.); (9) Los Angeles (Calif.) (H.D. 426, 77th Cong., 1st Sess.); (10) Savannah (N.C., S.C., Ga.) (H.D. 40, 83d Cong., 1st Sess.); (11) Youghiogheny (Pa., W. Va., Md.) (H.D. 39, 83d Cong., 1st Sess.); (12) Missouri (Mont., Wyo., Colo., N.D., S.D., Neb., Kans., Minn., Iowa, Mo.) (H.D. 373, 81st Cong., 1st Sess.); (13) Pee Dee (Va., N.C., S.C.) (H.D. 269, 78th Cong., 1st Sess.); (14) Potomac (Va., W. Va., Md., Pa.) (H.D. 269, 78th Cong., 1st Sess.); (15) Queen Creek (Ariz.) (H.D. 397, 82d Cong., 2d Sess.); (16) Santa Ynez (Calif.) (H.D. 518, 78th Cong., 2d Sess.); (17) Susquehanna, Lower (Rev. 7/53, not submitted); (18) Sny (Ill.) (H.D. 398, 82d Cong.,

2d Sess.); (19) Trinity (Tex.)(H.D. 708, 77th Cong., 2d Sess.); (20) Washita (Okla., Tex.)(H.D. 275, 78th Cong., 2d Sess.); (21) Yazoo (Miss.)(H.D. 564, 78th Cong., 2d Sess.); (22) Sevier Lake (Utah)(H.D. 406, 82d Cong., 2d Sess.); (23) Delaware River (N.Y., Pa., N.J., Del.)(H.D. 405, 82d Cong., 2d Sess.); (24) Pecos (Tex., N.M.)(H.D. 475, 82d Cong., 2d Sess.); (25) Scioto River (Ohio)(H.D. 409, 82d Cong., 2d Sess.). (62)

Eleven of these were authorized for implementation by the 1944 Flood Control Act. Of those not authorized, the plan for the Missouri River Basin merits some additional discussion.

Missouri River Basin Plan

The Army Corps of Engineers' "308" reports and studies by the Bureau of Reclamation during the 1920's and the 1930's began to define the over all water problems of the Missouri River Basin. The Corps prepared a plan for the basin emphasizing flood control and navigation. This plan was called the "Pick" plan after Division Engineer, Colonel Lewis A. Pick. The Bureau of Reclamation developed a plan for the Basin which stressed irrigation and hydroelectric power. It was called the "Sloan" plan after William G. Sloan who headed the study. The two plans were reconciled with relatively minor adjustments and called the "Pick-Sloan Plan". This plan was authorized by the Flood Control Act of 1944. (63)

Five dams were authorized and completed on the Missouri River downstream from the Fort Peck dam, which was completed in 1940. Their combined reservoir storage capacity was over 75 million acre-feet, including the Fort Peck reservoir. In addition to the main-stem dams, there were 103 dams and reservoirs authorized on the headwaters and various tributaries which would provide an additional 110 million acre-feet of storage. (64)

The Corps would be responsible for all the main-stem dams and those others with flood control and navigation as primary functions. The Bureau would be responsible for those upstream reservoirs whose primary functions would be irrigation and hydroelectric power generation. (65)

The Pick-Sloan Plan was not held in high esteem by all the residents of the Basin. The Conservation Federation of Missouri called attention to the following in 1944:

- At that time 36 major reservoirs were proposed for construction in Missouri by the Federal government and its agencies;
- These would flood out about 20,000 citizens and permanently inundate about 900,000 acres of the State's best valley farm lands.
- The average annual value of the loss of production from this acreage would be 18 million dollars. This was estimated to be three to four times the average annual flood loss. (66)

The problem was that the Pick-Sloan Plan "was lopsided because all it did was to try to control and use the water by impounding it after

it had run off the land into the big rivers; but what was really needed was first a program of land and water resource development that began to control and make use of the water on the land on which it fell and in the small streams - thus using the water all the way from the time it fell on the fields, forests and farms until it reached the big rivers". (67) Apparently others had the same feelings regarding the Pick-Sloan Plan, because USDA Secretary Brannan directed that a plan containing these principles be prepared. (68)

Gladwin E. Young was placed in charge of a work group to do this job. Each agency of the USDA was to cooperate and to provide the necessary staff. State Agricultural Colleges were asked to work with the group. In about a year an Agricultural Plan for the Missouri River Basin was completed. It was submitted to the Congress September 29, 1949, and published as House Document 373, 81st Cong., 1st Sess. The USDA plan attracted the interest of the press and the general public and came to be known as the "Young Plan". (69)

Along with the other USDA flood control survey reports, the USDA Missouri Basin Plan set "forth a broad program specifically designed to conserve and improve the soil for sustained productive use, protect and enhance the forest resource, abate flood and sediment damages, provide for more efficient land use through irrigation and drainage, protect the water resource,...." (70) These reports also were unique in that they placed the responsibility for implementation, operation and maintenance on the people who control and use privately owned land.

The "Young Plan" was one of the first reports to propose upstream flood water retarding structures to reduce flood flows. It contained proposals for from 14,000 to 16,000 such structures for a region containing about one-sixth of the area of the United States. (71)

These flood control surveys set the stage for the Watershed Protection and Flood Prevention program which was soon to follow.

Water Facilities Act of 1937

The Water Facilities Act of 1937 (P.L. 399, 75th Cong.), also known as the Pope-Jones Act, authorized the Secretary of Agriculture to plan and construct agricultural water storage and utilization projects in the arid and semiarid areas of the United States. The projects could be located either on federally or privately owned land. (72)

In July 1938, the Secretary of Agriculture directed the Soil Conservation Service to participate with the Bureau of Agricultural Economics and the Farm Security Administration in carrying out this program. It consisted of helping farmers and ranchers in the low-rain-fall areas of the 17 Western States in building up water supplies through new installations, repair or enlargement of existing facilities, and developing conservation-management plans for those farms and ranches where work was to be done. (73)

Applications for assistance were made on an area basis. The Bureau of Agricultural Economics prepared the area plan, including justification for the project. The Soil Conservation Service provided the engineering and other technical assistance needed for implementation of the plan. The Farm Security Administration provided financial assistance through loans. Overall program guidance was provided from the Secretary's office by a Water Facilities Coordinator. (74)

On January 1, 1937, the Resettlement Administration, established on April 30, 1935, as an independent agency, was transferred to the Department of Agriculture. It was responsible for the welfare of poverty-stricken people on the land. Later in 1937 its name was changed to the "Farm Security Administration". Its most popular program was the supervised loan program. (75)

Responsibility for the action phases of the Water Facilities Program remained with SCS until July 1, 1942. At that time its responsibilities were transferred to the Farm Security Administration (Secretary's Memo. 969, Jan. 12, 1942). (76)

Land Utilization and Retirement of Submarginal Land Program

Title III of the Bankhead-Jones Farm Tenant Act of July 22, 1937, (P.L. 210, 75th Cong.)(7 U.S.C. 1010) authorized and directed the Secretary of Agriculture

"to develop a program of land conservation and land utilization, and in order thereby to correct maladjustments in land use, and thus assist in controlling soil erosion, reforestation, preserving natural resources, protecting fish and wildlife, developing and protecting recreational facilities, mitigating floods, preventing impairments of dams and reservoirs, conserving surface and subsurface moisture, protecting the watersheds of navigable streams, and protecting the public lands health, safety and welfare...."

This program was initiated by the Resettlement Administration. The responsibility for administering it was transferred to the Soil Conservation Service on November 1, 1938, (Secretary's Memo. 785, Oct. 6, 1938 and 790, Oct. 20, 1938).(77)

Under this program some dams were constructed for floodwater storage, recreation and other purposes. (78) At the time of the transfer of program responsibility to the SCS many of these dams were still under construction. The SCS completed, operated and maintained them until the program was transferred to the Forest Service on January 1, 1954. (79)

Case-Wheeler Program

The Water Conservation and Utilization Program authorized by the Case-Wheeler Act of August 11, 1939, (P.L. 398, 76th Cong., 1st Sess.)

directed the Secretary of the Interior "to undertake the construction, including acquisition of water rights, rights-of-way, and other interests in land, of water conservation and utilization projects in the Great Plains and arid and semiarid areas of the United States". Any money expended on these projects was to be repaid to the United States by the water users in not to exceed forty annual installments. The program was to provide assistance on privately owned land. (80)(81)

The Secretary of Agriculture was authorized to participate in the Case-Wheeler Program by Public Law 76-848, (54 Stat. 1119, Sections 590 Y - Z 10). Sections 590 Z-3 and Z-4 state:

"in order to further in the Great Plains and arid and semiarid areas of the U. S. an effective rehabilitation program, stabilization of the agricultural economy and maximum utilization of funds spent for relief purposes, the Secretary of Agriculture is authorized pursuant to cooperative agreement with the Secretary of the Interior (1) to arrange for the settlement of projects on a sound agricultural basis, and insofar as practicable, the location thereon of persons in need; (2) to extend guidance and advice to settlers thereon in matters of farm practice, soil conservation, and efficient land use; (3) to acquire agricultural lands within the boundaries of such projects, with titles, and at prices satisfactory to him; and (4) to arrange for the improvement of lands within the project boundaries, including clearing, leveling, and preparing them for distribution of irrigation water."

In practice, the Bureau of Reclamation, acting for the Secretary of the Interior, selected the project area, procured the land, developed the irrigation water supply or source, and the project irrigation water distribution system. The project was then turned over to the Department of Agriculture for development of on-farm distribution systems, including appropriate land preparation, and resale to private ownership, utilizing available loan programs. Initially the Bureau of Agricultural Economics handled the USDA phase of the program. It was later transferred to the SCS to administer (War Food Administrators Memo. 27 - Revision 1, Amendment 6). (82)

The program had considerable potential but came to an unfortunate end because of divided authorities. The Bureau too often did not give enough attention to the characteristics of the soils of the projects. Often, after development of the water supply and major distribution system, it was not possible to develop efficient on-farm systems due to soils. The program developed a bad reputation, even though some fair projects were developed. Finally it was terminated in 1960. (83)(84)

CHAPTER 3

POST WORLD WAR II ACTIVITIES (1944-1954)

Flood Control Act of 1944

The Flood Control Act of 1944 authorized the installation of the works of improvement contained in 11 of the survey reports completed by the Secretary of Agriculture under authority of the Flood Control Act of 1936. Sec. 13 of the 1944 Act stated in part:

"That the following works of improvement for run-off and waterflow retardation, and soil-erosion prevention, are hereby adopted and authorized in the interest of the national security and with a view toward an adequate reservoir of useful and worthy public works for the post-war construction program to be prosecuted by the Department of Agriculture, under the direction of the Secretary of Agriculture, in accordance with the plans of the respective reports hereinafter designated and subject to the conditions set forth therein:....." (85)

The watershed reports authorized for implementation were: Los Angeles River Basin; Santa Ynez River Watershed; Trinity River Basin (Texas); Little Tallahatchie River Watershed; Yazoo River Watershed; Coosa River Watershed (above Rome, Georgia); Little Sioux River Watershed; Potomac River Watershed; Buffalo Creek Watershed (New York), Buffalo, Cayuga and Cazenovia Creeks; Colorado River Watershed (Texas); Washita River Watershed. (86)

As approved by the Congress, these projects consisted mainly of accelerated land treatment measures and practices. They contained no structural measures. However, the Department's watershed reports began to include proposals for structural measures after 1948. Secretary Brannan's 1949 Missouri Basin Agricultural Plan contained proposals for structural measures estimated to cost about \$1 billion. The Fiscal Year 1951 USDA Appropriations Act contained language that permitted the 11 authorized projects to include upstream floodwater detention reservoirs, channel improvements, and other structural measures. (87)

Apparently this expanded authorization to include structural measures was anticipated in some sections of the country. When Congress appropriated funds for planning upstream flood prevention work in 1946, planning was started on the Sandstone Creek Subwatershed of the Washita River in Oklahoma. A subwatershed plan designed to reduce erosion and flood-water damages was developed by the soil conservation district supervisors, landowners, interested local organizations, and agencies of the Federal Government. The plan called for conservation treatment of the farmland and ranch land and for such structural measures as floodwater retarding dams, sediment-control structures, and channel improvement. (88)

The 24 floodwater detention structures would control the run-off from 70 percent of the watershed and protect 95 percent of the flood

USDA FLOOD PREVENTION
ANNUAL OBLIGATIONS
(11 AUTHORIZED WATERSHEDS)

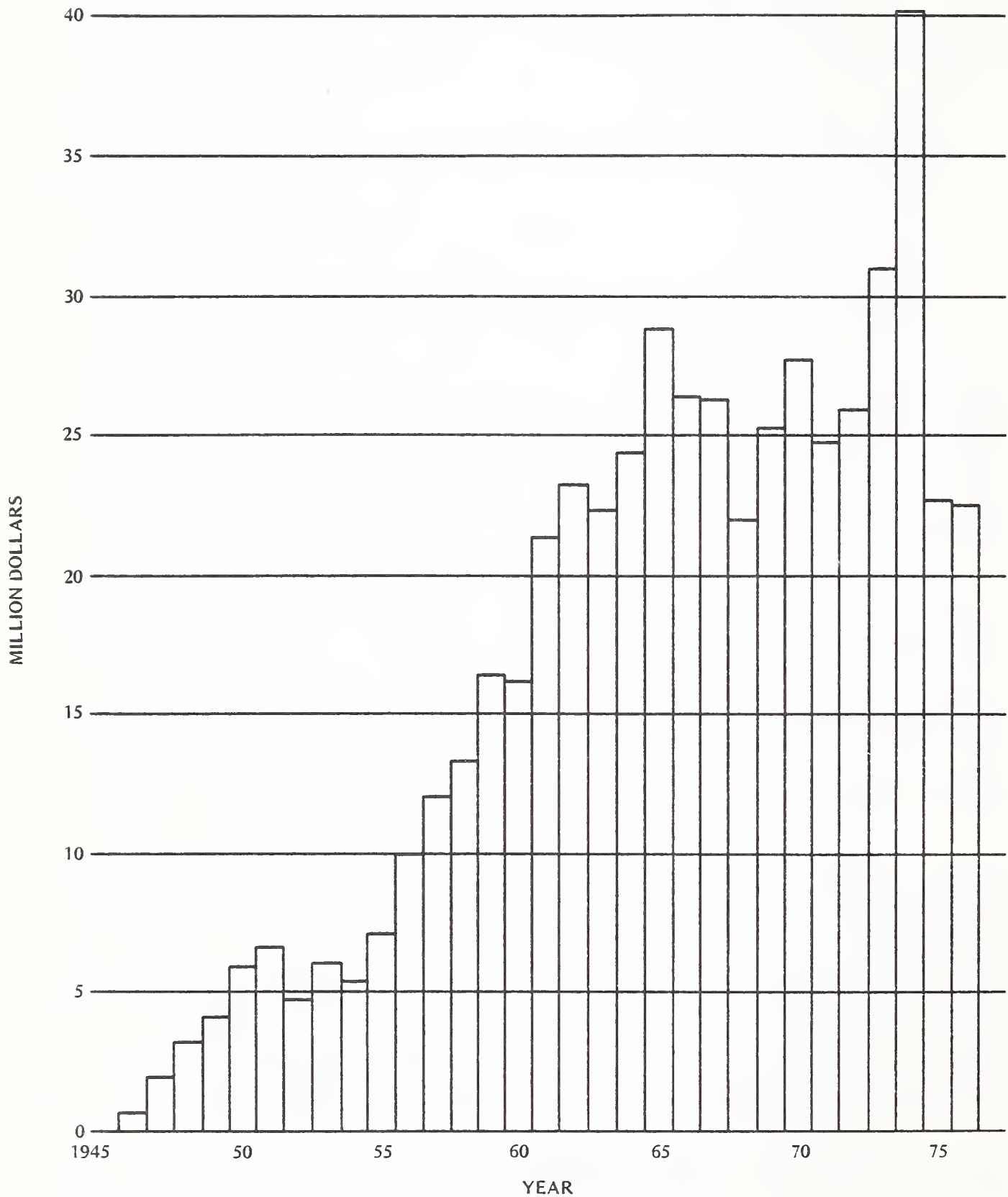


FIGURE 1

plain. The first construction contract was awarded in June 1950. It covered two structures. Construction of the 24 dams was completed in November 1952. Sandstone Creek was one of the first watersheds in the nation ready for the installation of a complete flood prevention program, including both land treatment and interrelated upstream measures. (89)

The 11 authorized watershed projects became the predecessors of the small watershed projects authorized by the Agricultural Appropriations Act of 1953 and the Watershed Protection and Flood Prevention Act of 1954 (P.L. 83-566). As the initial scope of the P.L. 83-566 projects was expanded, the same authorities were extended to the authorized watershed projects. Therefore, the same basic authorities and purposes are now included in the 11 authorized projects as in the P.L. 83-566 projects. (90)

The Soil Conservation Service and the Forest Service have joint responsibilities in discharging the Secretary of Agriculture's responsibility in this program. The SCS has program leadership and is responsible for work on privately owned land. The Forest Service is responsible for all watershed work in National Forests and provides technical assistance for work on other forest land in each watershed. (91)

The local people develop subwatershed work plans with the assistance of the SCS and Forest Service. Other agencies also assist when the need arises and they are requested to do so; i.e.: Federal financial assistance for land treatment is generally available through the Agricultural Conservation Program; loans may be available to eligible sponsors through the Farmers Home Administration after a plan has been approved; and the Economic Research Service appraises the impact of a project on the local economy. (92)

Cost sharing is such that local people put about the same amount of money into these projects as the Federal government. As of June 1975 the Federal government had spent \$464,452,000 and, as of June 1974, it is estimated the local people had spent \$379,636,000. Only one project has been reported as complete: Buffalo Creek, N.Y. in 1964. (93)

Annual obligations for the program are shown in figure 1 (SCS Budget and Finance Division Records).

Some examples of the accomplishments of these projects are:

- Yazoo-Little Tallahatchie Project.

"Total accomplishments throughout the life of the Project were brought into focus when the American Bicentennial Commission selected the Y-LT as one of the Nation's 200 Horizons on Display sites to commemorate America's birth. The selection was based on the Project's outstanding achievements in land rehabilitation which restored the economy and enhanced the quality of life for people of North Mississippi." (94)

During the period 1948-1976 the project, under the leadership of the Forest Service, had been responsible for planting 692,767,000 trees on 591,704 acres of badly eroded land. An additional 94,088,000 trees had been planted on 105,950 acres by other sources. (95)

- Accomplishments in the construction of multiple-purpose and flood-water retarding structures through fiscal year 1977 are: Washita River Project - 1,001; Trinity River Project - 847; Middle Colorado River Project - 268. (96)

Currently emphasis is being placed on the completion of planned land treatment measures, including tree planting and other forestry measures, in order to ensure a balanced watershed treatment program. Remaining planned structural measures are being installed as rapidly as available funds, land rights, and environmental constraints will permit.

Pilot Watershed Projects

A hearing was held on the Missouri Basin Agricultural Plan before a subcommittee of the House Committee on Agriculture in 1951. At this hearing, House Members supported their constituents demands that flood prevention in upstream watersheds be started without waiting for full river basin development. In 1952 the chairman of the subcommittee introduced a bill that would implement a small watershed program. This bill was stopped in the House Rules Committee by Public Works Committee members who sided with the bill's opponents, the Corps of Engineers and the Bureau of Reclamation. (97)

In 1953 the new chairman of the House Agriculture Committee re-introduced a small watershed bill embodying most of the features of the one introduced in the preceding Congress. Also, supporters of the small watershed program on the House and Senate Agricultural Appropriations Committees obtained an appropriation of \$5 million for a "pilot" watershed program. The object of this program was to demonstrate the effectiveness of 62 watershed projects in 33 states. Neither USDA nor Bureau of the Budget had submitted estimates for this program, nor was there any specific legislative authorization for it. (98)

The Secretary had assigned responsibility for administration of all of USDA's flood-control and river-basin investigation activities to SCS by Memorandum 1325, dated April 1, 1953. Therefore, SCS was assigned leadership responsibility for the "Pilot Watersheds Program", including responsibility for approving the areas to serve as pilot watersheds in a cooperative program and for helping local groups with technical phases of the work. (99)

All 62 watersheds were selected and designated between August 9 and December 8, 1953. (100) SCS immediately initiated planning activities in the 62 watersheds. The plans were designed to demonstrate the practicability of complete watershed protection as a means of conserving soil and water; of reducing flood water and sediment damages, silting of reservoirs, and impairment of stream channels; and of solving or alleviating other upstream land and water problems. (101)

These projects had another assigned function. They were to provide a basis for hydrologic and economic evaluation of the effects

USDA OBLIGATIONS PILOT WATERSHEDS (ANNUAL AND CUMULATIVE)

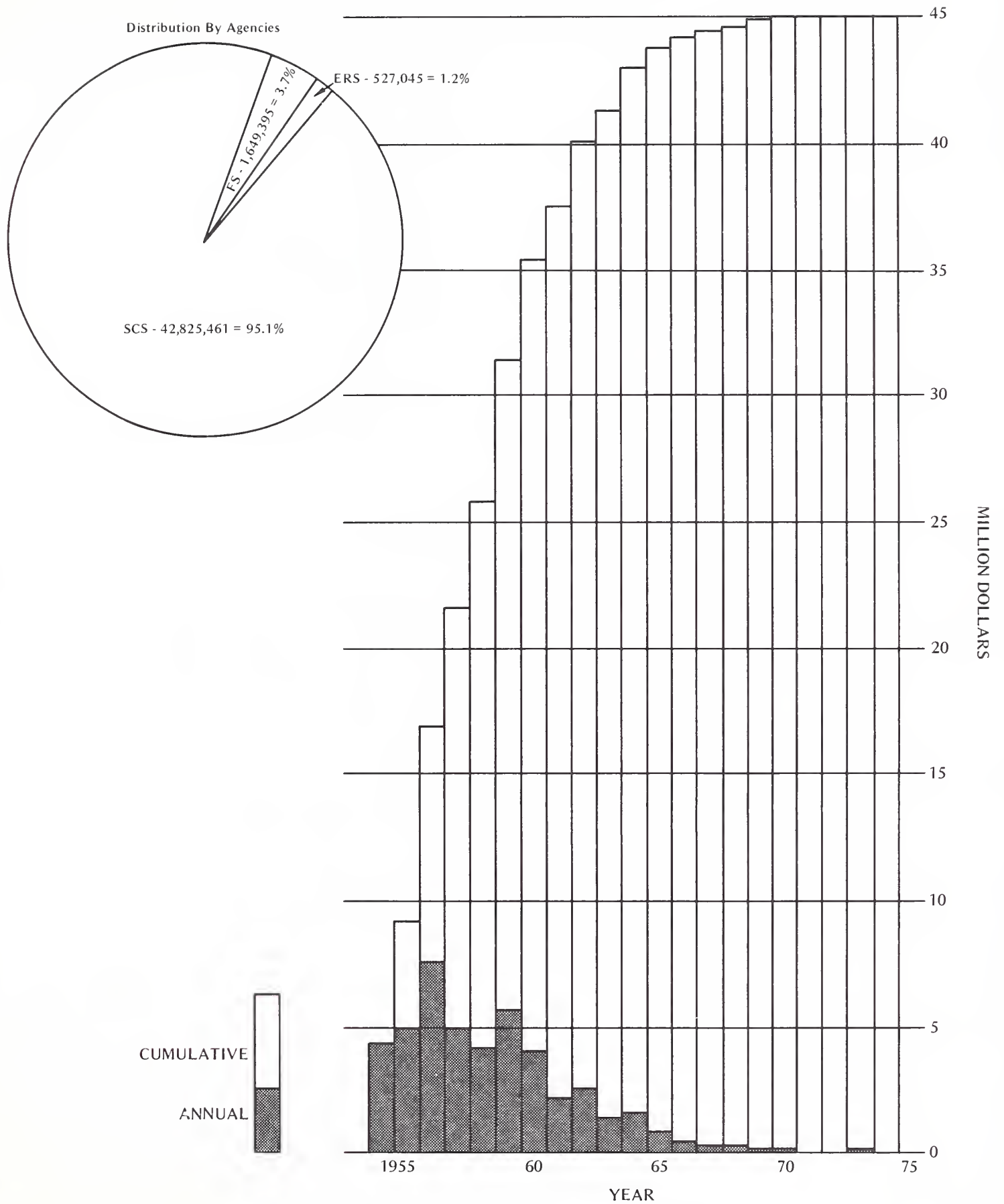


FIGURE 2

of the planned and installed works of improvement. Appropriate agreements were reached with U. S. Geological Survey to make the hydrologic evaluations and with the Economic Research Service to make the economic evaluations.

Distribution of the watersheds among the states was as follows:

Arizona - 1	New Mexico - 2
Arkansas - 1	New York - 4
California - 3	North Carolina - 1
Colorado - 1	North Dakota - 1
Georgia - 1	Ohio - 2
Idaho - 1	Oklahoma - 1
Illinois - 3	Pennsylvania - 1
Indiana - 1	South Carolina - 1
Iowa - 3	South Dakota - 1
Kansas - 6	Tennessee - 1
Kentucky - 4	Texas - 4
Minnesota - 2	Utah - 2
Missouri - 2	Virginia - 1
Montana - 1	Washington - 2
Nebraska - 4	West Virginia - 1
New Hampshire - 1	Wisconsin - 1
New Jersey - 1	(102)

In the operations phase of the program, planned works of improvement were installed on 54 of the original 62 projects. Only eight were terminated. In view of the limited participation of local people in the selection of these projects and the speed with which they were selected, this is an excellent record. The last projects were completed in 1972. Several of the project evaluation programs were terminated as early as 1957. The last one, Cow Bayou, Texas, was terminated in 1975. Total Federal obligations for this program amounted to \$43,634,379. No project funds have been obligated since 1974. (103) See figure 2 for annual and cumulative figures. (SCS Budget and Finance Division Records)

The only incomplete activities for this program are some reports from U. S. Geological Survey and Agricultural Research Service.

The accomplishments of this program consisted of an acceleration of the installation of land treatment measures on the farm lands of the watersheds and the installation of the following structural measures: (104)

Floodwater retarding dams (No.)	384
Channel work (Mi.)	287
Grade stabilization structures (No.)	475
Silt and debris basins (No.)	152
Floodways (Mi.)	132

Other Activities

In December 1938, the Secretary of Agriculture had transferred to the SCS that part of the work of the Division of Irrigation and Drainage of the Bureau of Agricultural Engineers that dealt with drainage and irrigation investigations, experiments, and demonstrations. (105) This action had been authorized on October 6, 1938, when the Secretary announced a realignment of USDA functions. (106) This transfer also made the SCS responsible for water supply forecasting (snow surveys) in the Western States. (107)

This action was highly significant to SCS in that prior to this time it had no authority to carry out work in the field of agricultural water management. Public Law 74-46 had been silent on this field of activity. The Agricultural Appropriations Act of 1940 (P.L. 76-159) June 30, 1939, and subsequent appropriations acts included specific language which authorized SCS to spend money on irrigation and drainage activities. (108) SCS became heavily involved in on-farm irrigation and drainage activities in the 1940's and 1950's.

On November 2, 1953, the Department underwent a reorganization. Under this action all soil conservation research, except investigations required for the national soil survey administered by the SCS, was transferred from the SCS to the Agricultural Research Service, effective date January 4, 1954. (109) The ARS had been established on November 2, 1953, under Secretary's Memo. 1320, Supplement 4. (110)

On August 17, 1954, an amendment was passed to the Water Facilities Act of 1937 (P.L. 597, 83d Cong.). This Amendment extended the water facilities loan program of the Farmers Home Administration to the entire Nation. It formerly was limited to the 17 Western States. This was an important action for the flood prevention programs which would utilize watershed loans throughout the U. S. (111)

The Watershed Protection and Flood Prevention Act (P.L. 83-566) was passed by Congress and signed by the President on August 4, 1954. The Act authorizes a permanent Nationwide program by which USDA provides technical and financial assistance to local watershed groups willing to assume responsibility for initiating, carrying out, and sharing the costs of upstream watershed conservation and flood control. SCS was given leadership responsibility for this program. It was designated as the USDA action agency with primary responsibility for USDA's cooperation with local organizations in small watersheds throughout the Nation. (112)

The watershed program is unique among Federal water programs. It is a Federally assisted program, not a Federal program. All actions pertaining to this program have to be initiated by local people. Decisions as to scope and scale of any project are theirs. The Federal government's commitment to cooperate on any proposed project is based on current policy, approved guidelines, and Congressional constraints. The first amendment to the basic act (P.L. 84-1018)(70 Stat. 1058) August 7, 1956, added authority to include agricultural water management purposes

in proposed projects. This was the first time SCS had been given legislative authority to provide assistance in irrigation and drainage. Prior to this time it had used transfer responsibilities and permitting language in appropriations acts.

The Watershed Protection and Flood Prevention Act was a landmark action for SCS. It added a new scope to its program responsibilities and provided it with a new set of incentives to get a complete conservation program with interrelated structural measures installed on the ground. Its importance is such that the entire next chapter of this document is devoted to this program.

CHAPTER 4

WATERSHED PROTECTION AND FLOOD PREVENTION PROGRAM

Legislation

The Watershed Protection and Flood Prevention Act (P.L. 83-566) was approved by the President on August 4, 1954. Robert J. Morgan, in his article "The Small Watershed Program", stated that this was a Soil Conservation Service program. It was wanted by the Soil Conservation Districts and their bipartisan congressional supporters. However, it was at variance with the river basin planning approach of the Truman administration. Also, it was not consistent with the "free enterprise" thinking of the Eisenhower administration. (113)

The Act authorized the Secretary of Agriculture to help local organizations plan and carry out works of improvement for flood prevention and agricultural aspects of water use and conservation on watersheds which did not exceed 250,000 acres in size. The assistance included conducting investigations and surveys, developing a watershed protection plan and an engineering plan for needed structural measures, determining the economic feasibility of the proposed plan, entering into agreements with local organizations for installation of planned works of improvement and their operation and maintenance, and providing financial and other assistance to the sponsoring local organizations. (114)

In addition to the size of the watershed, the Act provided that a plan could include no single structure with a total storage capacity in excess of 5,000 acre-feet. It also required that the local people were to pay an equitable share of the construction costs as determined by the Secretary. (115)

The basic authorities included in this Act were not new in the sense that they already existed in the 11 Authorized Flood Prevention Watersheds and the 62 Pilot Watersheds. However, these were restricted to specific watersheds. The authorities were new in that they were permanent and extended nationwide.

The Act terminated USDA activities under the Flood Control Act of 1936, as amended and supplemented, except for completion of the works of improvement in the 11 Authorized Watersheds as provided in the Flood Control Act of 1944. It also retained USDA's authority for participation in certain emergency measures for run-off retardation and soil erosion prevention as provided for in Sec. 216, Flood Control Act of 1950 (P.L. 81-516, 64 Stat. 163, 184). (116)

New authority for continuing river basin investigations was included in Sec. 6 of the Act, which provided that such investigations

could be carried out in cooperation with other Federal, state and local agencies. This was a significant feature because it permitted USDA to continue to work with the other Federal and state agencies on interagency river basin commissions and later with the Water Resources Council. (117)

In 1956, P.L. 566 was amended in response to complaints that the Act gave its local clientele less financial assistance than the programs of the Corps of Engineers and the Bureau of Reclamation provided. The complaints further stated that local interests who wished to participate could not meet their costs. The Administration opposed the amendments, but to no effect. (118)

The 1956 amendments were contained in P.L. 84-1018, 70 Stat. 1058 (August 7, 1956). They provided the following:

1. Required the Federal government to pay 100 percent of the construction costs allocated to flood prevention;
2. Added agriculture water management (irrigation and drainage) as eligible purposes;
3. Increased the maximum size of dams and reservoirs for upstream protection from 5,000 to 25,000 acre-feet, provided that not more than 5,000 acre-feet were devoted to flood protection;
4. Authorized the inclusion of works for municipal and industrial water supply. Such works were to be paid for by local interests, including engineering assistance for this purpose;
5. Authorized the Secretary to make loans up to \$5,000,000 to local organizations to finance their share of the costs;
6. Extended the program to include Hawaii, Alaska, Puerto Rico and the Virgin Islands. (119)

These amendments also changed the rules concerning agency review and congressional committee supervision. Those projects which do not require Federal financial contributions to construction costs in excess of \$250,000 and which do not include any single structure which provides more than 2,500 acre-feet of total capacity can be approved administratively without review by the other construction agencies. All larger projects require review by the Corps of Engineers. If they include irrigation works or affect public lands or wild life, they also must be reviewed by the Department of the Interior. (120)

The larger projects must be approved individually by the appropriate committees of the Senate and House of Representatives. Any plan which involves no single structure providing more than 4,000 acre-feet of total capacity comes under the jurisdiction of the Committee on Agriculture and Forestry of the Senate and the Committee on Agriculture of the House. Any plan involving a single structure providing more than 4,000 acre-feet of total storage capacity comes under the jurisdiction of the Committees on Public Works of the Senate and the House. (121)

Subsequent amendments to the basic Act are as follows:

1. P.L. 85-624, 72 Stat. 563, (August 12, 1958)
 - Provided for coordination with the Secretary of the Interior on the approved fish and wildlife aspects of the proposed watershed projects (122);
2. P.L. 85-865, 72 Stat. 1605, (September 2, 1958)
 - Authorized cost-sharing for fish and wildlife purposes (123);
3. P.L. 86-468, 74 Stat. 131, (April 13, 1960)
 - Extended the provisions of P.L. 83-566 for additional works of improvement to the 11 authorized watershed improvement programs (124);
4. P.L. 86-545, 74 Stat. 254, (June 29, 1960)
 - Liberalized procedures with respect to acquisition of land, easements, and rights-of-way where condemnation of land rights is involved (125);
5. P.L. 87-170, 75 Stat. 408, (August 30, 1961)
 - Broadened the definition of "local organizations" (126);
6. P.L. 87-703, 76 Stat. 615, (September 27, 1962)
 - Provided for recreation cost-sharing, advancement of funds for sites for future construction, and advancement of funds to develop water supply for future municipal and industrial use in any multiple purpose reservoir (127);
7. P.L. 89-337, 79 Stat. 1300, (November 8, 1965)
 - Increased allowable storage capacity for flood prevention from 5,000 acre-feet to 12,500 acre-feet (128);
8. P.L. 90-361, 82 Stat. 250, (June 27, 1968)
 - Authorized the Secretary of Agriculture to contract for the construction of works of improvement upon request of the local organization (129);
9. P.L. 92-919, 86 Stat. 676, (August 30, 1972)
 - Authorized certain technical and financial assistance to public bodies for water quality management, conservation and proper utilization of land (control of agriculture-related pollution and disposal of solid wastes), municipal and industrial water supply, ground water recharge, use of other Federal funds for land rights, and long-term contracting for land treatment (assistance to individuals), and interagency coordination with EPA and HEW for those aspects of plans dealing with water quality pollution abatement and public health features (130);
10. P.L. 95-113, 91 Stat. 913, (October 1, 1977)
 - Increased authority for administrative approval of watershed work plans from \$250,000 to \$1,000,000 of P.L. 566 construction costs.

Characteristics of the Program

The Watershed Protection and Flood Prevention Program is a Federally assisted program. All program activities are initiated by sponsoring organizations, not by the Federal government. The program also is unique in other ways:

1. Land treatment measures, those measures and practices which are installed for soil and water conservation and erosion control, are the first increment of project evaluation. This is accomplished by identifying hydrologic soil groups in the watershed. Then the hydrologist,

**WATERSHED PROTECTION
PLANS APPROVED EACH YEAR**

1956-1976

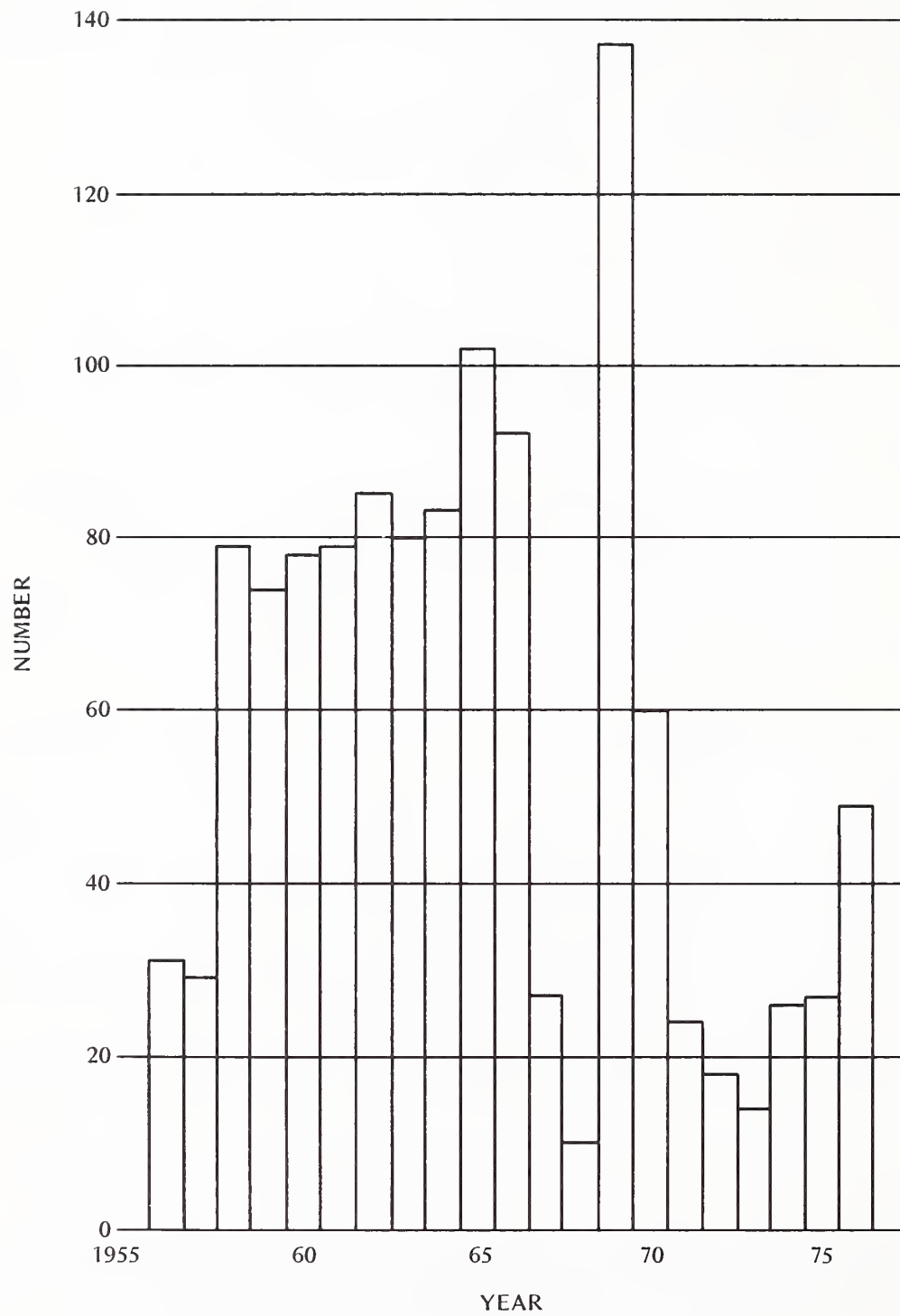


FIGURE 3

geologist, soil scientist, district conservationist, and a Forest Service technician, when applicable, develop the soil-cover-complex conditions for various segments of the watershed for without- and with-project conditions. Run-off curve numbers are calculated and run-off is estimated for storms in the evaluation series for both without- and with-project conditions. The percent reduction in surface run-off brought about by the land treatment project measures provides the basis for estimating damage reduction benefits to be credited to these works of improvement. Damage reduction benefits resulting from structural measures are estimated from a revised damage base. (131)

2. The closely knit interdisciplinary team used in watershed planning is not commonly found in other agencies' water resource programs.

3. Floodwater retarding structures have non-regulated principal spillways and usually have vegetated emergency spillways. Often the principal spillways operate with a two-stage inlet to increase the hydraulic and economic efficiency of the structure. The low stage may operate with a very low release rate to give maximum protection to the flood plain from the smaller, more frequent storms. The high stage will operate at a much higher release rate to permit more rapid dewatering of the flood pool and reduce the volume of flood water storage required.

4. Project channels in combination with structural release rates are designed to provide the level of protection necessary for the flood plain values. For example, if high value crops, such as celery, are grown in some reaches of the flood plain it may be necessary to prevent all flooding from 10-year or less frequency storms. On the other hand, improved pastures with legumes may be able to stand shallow, low-velocity floodwaters for 48 to 72 hours without damage, and tree seedlings may stand up to seven days inundation.

The nature of watershed projects is such that desired variations can be adapted to different flood plain reaches as the existing or expected values may demand.

Watershed Planning

Watershed project planning is a coordinated analysis of watershed problems and potential solutions by a team of technicians representing various disciplines. The principal disciplines are economics, hydrology, geology, engineering, soil science and plant technology. These may be supplemented by biologists, recreation specialists, foresters, and water quality engineers as needed. There is no defined line between the areas of responsibility of each of these disciplines. The actions and decisions of each is dependent upon and interrelated with the others. Plan formulation requires that the technicians select alternative systems of improvements which are economically feasible and compatible with the economic and social conditions of the watershed. These are presented to the sponsoring organizations and concerned people for review, consideration, and selection of a system or combination of systems which meet their objectives and are acceptable to them for implementation. (132)

There is a great need for this program. The National Inventory of Soil and Water Conservation Needs, 1967, showed that there are 8,925

USDA OBLIGATIONS
WATERSHED PROTECTION AND
FLOOD PREVENTION PLANNING

ANNUAL

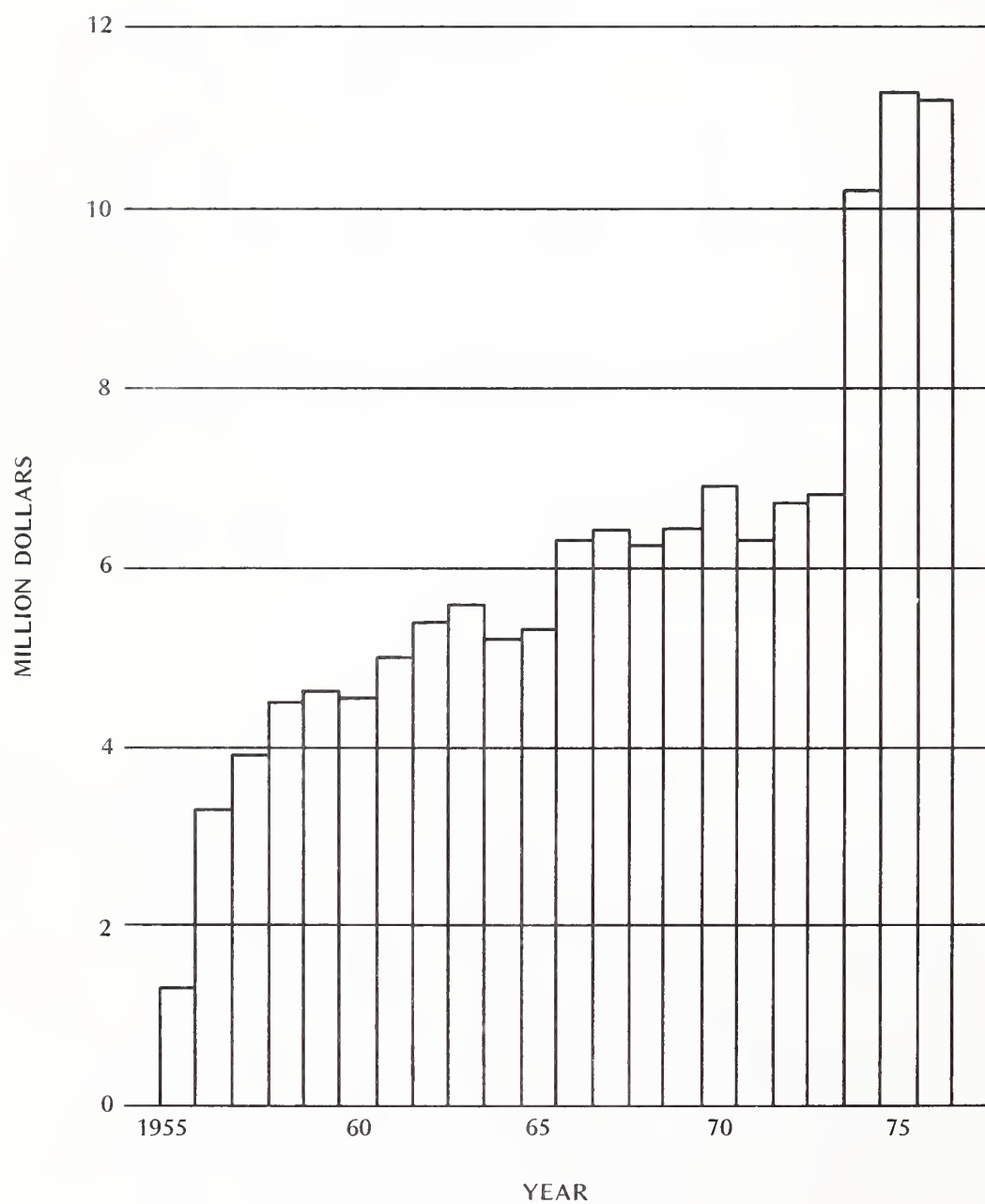


FIGURE 4

eligible watersheds for which project development is potentially feasible. (133)

The program proved to be quite popular with watershed communities having water problems. By January 1961, applications for planning assistance had been received on 1,088 watersheds. Of these, 516 had been authorized to receive planning assistance and 289 had been authorized for operations. (134) This popularity was reflected further by State legislative actions. Between 1955 and 1963, 43 State legislatures enacted laws to expedite cooperation between State and local agencies and the Department of Agriculture in watershed project activities. In all, 285 laws were enacted in the 43 States during this nine-year period. (135)

The popularity of the program has continued and there is still a demand for the services and assistance provided through it. By July 1, 1965, applications had been received for planning assistance on 2,317 watersheds. Of these, 1,111 had been approved for planning and 635 project plans had been approved for operations. As of April 1, 1977, the number of applications had reached 2,860, the number approved for planning - 1,752, and the number authorized for operations - 1,185. An analysis of these figures indicates a significant decrease in rate of accomplishment during the 12-year period, 1965 - 1977, as compared to the four-year period, 1961 - 1965. The application rate dropped from 307 to 45 per year; the approved for planning from 149 to 53 per year; and the approved for operations from 86 to 46 per year. There are a number of factors which contributed to this condition. These are described later in this chapter.

Actual planning accomplishments by years are shown in Figure 3. Annual Federal obligations are shown in Figure 4. A study of Figure 3 shows that by 1958 planning had reached a high annual rate of accomplishment and remained high through 1966. Then annual rates of approval of plans dropped significantly. This reflects the impacts of problems and new constraints.

Constraints

The House Agriculture Subcommittee on Conservation and Credit has imposed a number of constraints on watershed work plans. Since this Sub-Committee has to pass on all plans for which the law requires Congressional approval by the Agriculture Committees, these constraints have a significant impact on watershed work plans: (136)

1. The prorated P.L. 566 construction cost per benefitted acre should not exceed \$200 per acre;

This criterion was established about 1961. At that time \$200 per acre represented the average top value of agricultural enterprise land. In the middle nineteen sixties, some exceptions were made for especially high valued agricultural areas such as orchard and vegetable land. Between 1961 and 1974, construction costs increased about 146 percent and farm real estate values increased about 163 percent. This rise in construction costs and the resulting costs per acre benefitted

has made it increasingly difficult to meet the cost per benefitted acre limitation.

2. Flood prevention or drainage must be the dominant purpose; The determination of dominant purpose poses several questions:

- Will the determination be made on cost relationships or benefit relationships?
- Will keeping flood prevention the dominant purpose limit the formulation of the plan to something less than is needed or desired to solve all water resource problems and needs?
- Will this criterion relegate small projects to single purpose flood prevention projects?
- Will sponsors of small projects be denied municipal water supply or recreation services as a result of this criterion?

3. P.L. 566 project costs should be limited to \$5,000,000; With the great increase in construction costs, this places a severe limitation on project scale and scope.

4. Single purpose recreation sites should not be included in projects;

In some instances this may deny a community a needed service.

5. The benefit-cost ratio should still be favorable when secondary, redevelopment, and incidental benefits are excluded;

This penalizes the watershed project with respect to other types of water resource development projects.

6. Projects with irrigation as a primary purpose should not be submitted to the Committee;

This criterion denies many watersheds in the Western States the services and benefits of this program.

7. Low priority is given to projects where flood prevention benefits are largely urban.

This could penalize agricultural areas adjacent to urban areas because the urban damage values would exceed the agricultural values. Also, in some instances it could deny urban areas the only opportunity for protection against floods which originate on adjacent agricultural lands.

Problems

1. Moratorium:

In 1966 the administration objected to the requirement that watershed project plans be approved by Congressional Committees. This requirement was included in the 1956 amendments to P.L. 83-566 (P.L. 84-1018, 70 Stat. 1058, August 7, 1956)(See p. 25, this chapter). For several months no project plans were transmitted through the Office of Management and Budget to the Congressional Committees. A backlog of more than 50 plans developed. When the Administration finally released the watershed work plans being withheld from the committees, it also transmitted proposed legislation. This proposed legislation would amend P.L. 83-566 to provide for Congressional review but not approval. It was

transmitted to the Second Session of the 89th Congress and again on January 17, 1967, to the First Session of the 90th Congress. This legislation was not enacted. (137)

The Administration continued to send watershed work plans to the appropriate Congressional Committees. However, in each transmittal it stated that the Congress should either (1) enact the legislation proposed by the Administration, or (2) take action by the Congress as a whole on legislation authorizing individual or preferably groups of projects. If this were not done, the President gave instructions not to proceed with the accomplishment of the projects. (138)

An examination of Figure 3 shows that only 27 projects were approved for operations in 1967 and 10 in 1968. These were made possible by administrative approvals and a few plans in the hands of the Committees before the Moratorium was placed in effect.

The Moratorium had a very detrimental effect on watershed planning, especially in 1968. Neither the sponsors of watershed projects nor SCS could see much to be gained by continuing to push for plans to be completed when the Administration would not permit work to begin on them.

This problem was resolved by the change in Administration in January 1969. On April 1, 1969, Secretary Hardin, USDA, received the following memorandum, dated March 27, 1969, from the President:

"Numerous proposed watershed projects authorized under the Flood Prevention Act of 1954 have been held in abeyance since 1966 because of a Constitutional question raised by the previous Administration which has remained unresolved.

"At your instance we have undertaken a thorough review of the issues, both legal and substantive, and decided that this Administration will interpose no objection to the procedures involved in the accomplishment of watershed projects under this law.

"Will you please transmit my decision to the appropriate Committees of Congress."

This removal of objections by the White House made all 96 watershed projects being held in abeyance eligible to receive assistance. (139)

Figure 3 shows that 137 work plans were approved in 1969 and 60 in 1970. The average number approved during the period 1967 - 1970 was 58.5 per year. For the four-year period 1963 - 1966 the average was 89.25 per year. During the period 1971 - 1976 the average has been 26.3. So the Moratorium was just the beginning of problems confronting watershed planning.

2. National Environmental Policy Act of 1969 (NEPA):

The National Environmental Policy Act of 1969 (P.L. 91-190) included three major elements: (1) the declaration of a National environmental policy; (2) the establishment of a set of procedural requirements, including but not limited to the EIS (Environmental Impact Statement); and (3) the creation of a Council on Environmental Quality (CEQ) to advise the President and oversee the implementation of the Act. (140)

At the time this Act was passed SCS had 621 watershed projects in operation on which construction had not been completed. In addition there were an undetermined number of sub-watershed work plans in the 11 Authorized River Basin Watersheds under construction. The Act requires that an EIS be prepared when a proposed major Federal action will generate significant adverse effects on the quality of the human environment. SCS initially considered that the major Federal action had been taken when a watershed work plan was approved for operations. Therefore, no EIS would be required for individual structural elements of a project already under construction. This interpretation was not allowed to stand when CEQ issued its guidelines.

The greatest environmental controversy regarding SCS projects was directed at channel modification. Therefore, initial effort at preparing EIS's was directed at those projects containing channel modification as a measure. For other projects under construction environmental assessments were made, and, where it was determined that an EIS would not be made, an environmental impact appraisal was prepared to document the rationale for not preparing an EIS. (141) This procedure has been developing through the period 1970 - 1977 when various instructions, memorandums and other guidelines have been developing. The final rule, which covers not only those projects in operation at the time of the Act but all new projects, was published in the Federal Register Vol. 42, No. 152, Monday, August 8, 1977.

These rules require that an EIS be prepared for any of the following actions:

- a. Major Federal actions which involve channel realignment or work to increase channel capacities.
- b. Watershed projects requiring Congressional action after the effective date of these rules.
- c. All other actions which are determined to be major Federal actions significantly affecting the quality of the human environment. (142)

Between passage of the Act and April 1, 1977, the SCS had completed 201 final EIS's, 11 draft EIS's and 183 negative declarations. Of these actions 216 had been taken on P.L. 566 projects which were operational as of December 31, 1969. (143) Comparable information on actions taken on sub-watersheds of the 11 Authorized River Watersheds is not readily available.

SCS got off to a slow start in the preparation of EIS's. Policies and procedures established by NEPA required considerable interpretation to translate them into operational criteria for administrative action. This task was left largely to the discretion of each agency and administrator. SCS considered the entire watershed and its several works of improvement as a single project. Each dam or channel modification was considered as an element. In fact, individual dams or channel reaches often were set aside as a construction unit. It did not consider the construction of any individual element as a major Federal action. Rather, it considered the authorization of a project as the major Federal action. When this definition was resolved it took appropriate action. This requirement became firm when the Natural Resources Defense Council got an injunction requiring an EIS on Chicod Creek Watershed Project in 1972. This was a channel project which had been in operation since August 22, 1966.

Andrew's analysis was that SCS interpreted NEPA as a reinforcement of its previous missions and policies. Consequently, it was at least two years after NEPA's enactment before it directed any change in the range of considerations entering into its water resource planning process. Also, SCS had not requested any new funds or personnel to carry out the mandate of NEPA until this time. (144)

SCS issued Watersheds Memorandum 103, a general policy statement, May 1, 1970. Environmental Memorandum No. 1, which provided specific instructions, was issued March 19, 1971. On May 24, 1972, Watershed Protection Handbook Notice 1-19 was issued. It directed SCS personnel to perform an environmental inventory during the first pre-planning environmental reconnaissance study; to present all feasible alternatives (including objectives which differed from those of the sponsors) in the impact statement; to conduct a public information meeting on the preliminary investigation report; and to append to the final EIS copies of all substantive letters of comment submitted on the draft statement. SCS had prepared 87 detailed statements on water projects by the end of 1971. (145)

Stream channelization projects were virtually the only category of SCS actions that aroused concern about environmental impacts. (146) Therefore, in February, 1971, SCS issued Watersheds Memorandum 108. It called for a thorough re-evaluation of all planned channel modification work not yet installed to determine what changes in work plans or engineering design were needed to further national policy and goals for the enhancement of the environment. Some 401 P.L. 566 watershed projects and 52 flood prevention sub-watersheds were studied. The projects were categorized into three groups, depending on the likely impact of the remaining channel work on the environment. The findings were: (1) 44 percent were found to have either a positive effect or only a minor adverse impact; (2) another 44 percent were found to require some modifications to avoid possible adverse impacts; and (3) only 12 percent of the projects were found to need major changes. (147)

In the midst of the 108 review, SCS began a computer analysis of all planned and constructed channel work. This study covered 54 pilot

watersheds, 1057 P.L. 566 watersheds and 303 flood prevention sub-watersheds. The findings of this study were quite interesting. The total channel work planned amounted to a little over 21,000 miles. This included work on natural streams, man-made ditches, previously modified channels, and new channels. It included perennial streams, intermittent streams, and those that flow only after heavy rains. (148)

A further analysis of the study data showed that modification had been planned on just over 3,000 miles of natural, perennially flowing streams. This represented 14 percent of the total planned channel work of SCS. When this planned work was added to planned modification of man-made ditches and previously modified channels that had perennial flow or ponded water prior to the project, the total amounted to about 5,500 miles, or 26 percent. The remainder of the planned channel work included:

- 1,100 miles of clearing or removal of loose debris within present channels on streams and ditches with perennial flow;
- 7,000 miles of channels with intermittent flow, or involving new drainage mains or laterals;
- 7,000 miles of channels that flow only during periods of surface run-off; and
- 200 miles of streambank or grade stabilization work on any type channel. (149)

As of December 30, 1976, the total miles of channel modification included in SCS work plans amounted to 21,778. Of this amount 9,927 miles had been constructed as of that date. (150) These figures contradict rather strongly the charges that SCS plans to dig up 150,000 miles of streams and small rivers in the years ahead. (151)

The Natural Resources Defense Council (NRDC) has strongly opposed stream channelization. It developed and distributed Action Packet I to alert conservationists to the scope of environmental destruction it claimed was being caused by stream channelization. It mailed 2000 copies of this packet to members of conservation organizations, from whom it apparently received a gratifying response. These evidently were mailed out in late 1970 or early 1971, because in the summer of 1971 it mailed out Action Packet II. (152) This packet contained a list of 31 questions which interested persons were to ask each SCS State Conservationist about individual watershed projects in his state. The nature of the questions was such that many man-days would be required to respond on each project. (153)

The experience of SCS with NRDC was that it relied on personal opinions rather than facts. For example, its staff members often were heard to claim that channelization created a biological desert which would not recover in 40 years. In their study North, et al. found that channel modification and sewage discharge produced a moderate stress on the ecological system in Rooty Creek, Georgia. This stress had resulted in a reduction in the number of species of organisms inhabiting the stream but had not greatly affected the total production of organisms eight years

after channelization. (154) An analysis of sites both above and below the sewage outfall failed to indicate any significant effects of the sewage effluent upon benthos at downstream sites. (155) The findings of this study indicate that there is no basis for a claim that channelization alone will result in a biological desert of longstanding impacts.

In a letter dated October 3, 1972, a staff member of NRDC referred to Walter Cronkite's CBS Evening News telecast which included a brief TV newspiece regarding the precedent-setting Chicod Creek lawsuit in North Carolina. The letter stressed the fact that the suit claimed the planned channel modification would destroy natural stream and valuable wetland and swamp habitat for fish and wildlife. The letter, however, failed to mention that the newspiece was incomplete. The material pertaining to crop losses, high water tables, prolonged inundation of cropland, and health hazards due to overflow of septic tanks resulting from saturated soil conditions had been edited out of the telecast material. These were the impacts of existing watershed conditions on the farmers of the watershed. (156)

There was another significant study carried on during this time. The Council on Environmental Quality (CEQ) contracted with Arthur D. Little, Inc., to study channel modification work in 42 projects of the SCS, Corps of Engineers, Tennessee Valley Authority, and the Bureau of Reclamation. The Philadelphia Academy of Natural Sciences also participated in this study. The 1,000-page draft report of that study did not find channelization as destructive as claimed. It was severely criticized by a number of people and organizations whose positions on channel modification didn't match the tentative conclusions of A. D. Little. (157)

The reaction to the A. D. Little draft report of March 31, 1972, led to an extension of the study period and effort. The final report was documented in three volumes and 1,375 pages and was summarized in Congressional Hearings on March 22, 1973. It was submitted to CEQ on March 31, 1973. The study team found that 48.8 percent of the 2,300 miles of channel alterations examined in the field involved only rehabilitation and restoration of old drainage ditches. Recognizing the several antecedent or pre-project conditions and the external factors influencing stream systems and environmental quality, the study concluded that:

- the issue of wetland drainage was of minor to no significance on 26 of the 42 projects and uncertain on five others;
- the issue of bottomland hardwood losses was of minor to no significance on 28 of the 42 projects and uncertain on seven others;
- the issue of cutoff oxbows or meanders was of no significance on 35 of the 42 projects;
- the issue of water table changes and lost stream recharge capacity was of minor to no significance on 29 of the 42 projects and uncertain on all others;
- the issue of erosion and sedimentation was of minor or no significance on 24 of the projects, and uncertain on 15 others;

- the issue of downstream effects from upstream channel work was of minor to no significance on 31 of the 42 projects and uncertain on seven others.

Thus, the research data suggested that about 36 of the 42 projects offered no real basis for the kind of environmental policy action which popular expression of the issue had seemed to call for. (158)

The changes in SCS guidelines between 1972 and 1974 represented a major shift in posture toward implementation of NEPA's procedures. CEQ testified in 1974 that the impact statements produced by the Corps of Engineers were the best among Federal agencies, and those of SCS were among the most improved. (159) The demands on the time of watershed planning personnel to meet the requirements for preparing environmental impact statements for new and old plans, for making channel studies, and for responding to channelization correspondence were staggering.

3. The Uniform Relocation Assistance and Real Property Policies Act of 1970 - P.L. 91-646:

This Act provided for financial assistance to all individuals, families, and businesses which had to be relocated as a result of the construction of any works of improvement in a water resource development project. Implementation of the Act began in February and March 1971. All existing work plans that contained any works of improvement not yet completed had to be reviewed. If the provisions of this Act were applicable, the work plan had to be amended to comply with the Act. This action demanded time from both watershed planning and construction personnel.

(160) This Act has resulted in the obligation of the following funds:

<u>Year</u>	<u>P.L. 566</u>	<u>F.P.</u>	<u>RC&D</u>	<u>Total</u>
1971	-	-	-	-
1972	320,000	14,500	-	334,500
1973	879,400	-	-	879,400
1974	950,000	-	-	950,000
1975	380,000	137,000	37,700	554,700
1976	940,000	25,000	182,500	1,147,500
Total	3,469,400	176,500	220,200	3,866,100

4. Protection of Archeological and Historical Properties:

The Act of June 27, 1960, relating to the preservation of historical and archeological data, P.L. 86-523, 74 Stat. 220, as amended May 24, 1974, by P.L. 93-291, 88 Stat. 174, provides for the preservation of historical and archeological materials or data that might otherwise be lost or destroyed as a result of any Federal or Federally assisted or licensed project, activity or program. (161)

The National Historic Preservation Act, P.L. 89-665, 80 Stat. 915, as amended authorizes the Secretary of Interior to maintain and expand a National Register of Historic Places (NRHP). It also establishes the Advisory Council on Historic Preservation (ACHP). Section 106 of this Act requires that prior to the approval of any Federal or Federally-assisted or licensed undertaking, the Federal agency shall afford the ACHP a reasonable opportunity to comment, if properties listed in, or eligible for listing in, the NRHP are affected. (162)

Executive Order 11593, Protection and Enhancement of the Cultural Environment, provides that the Federal government shall furnish leadership in preserving, restoring, and maintaining the historical and cultural environment of the Nation. (163)

SCS recognizes that significant historical, archeological, and architectural resources are an important part of the Nation's heritage. It takes reasonable precautions to avoid damaging any of these and works with the National Park Service and the Advisory Council on Historic Preservation in identifying and seeking to avoid or mitigate adverse effects of SCS-assisted projects on the Nation's cultural resources. (164)

SCS assistance to individual land users under the Conservation Operations and Great Plains Programs is considered to be a nonproject undertaking. Its actions in these cases are limited to advisory activities. In the case of project-type programs, SCS determines the environmental effects including archeological and historical impacts as an integral part of the environmental assessment process. (165)

SCS works with the following agencies in carrying out its responsibilities under this program:

- Advisory Council on Historic Preservation which is national in scope. The Secretary of Agriculture is a member of this Council.
- National Park Service. This agency also works at the national level and many of its actions duplicate those of the Advisory Council. It contains the Office of Archeology and Historic Preservation and the Office of National Register of Historic Places.
- State Historic Preservation Offices.

Often there is considerable difficulty in getting agreement among each of these agencies. Archeologists want a survey of each farm before assistance is given under the Conservation Operations and Great Plains Programs. However, this is impractical.

It is estimated that this program will require a transfer of from \$1 million to \$3 million of SCS funds to the National Park Service (NPS) annually. Each SCS State Conservationist can transfer to NPS up to one percent of the Federal share of construction costs for each measure causing a problem.

5. Principles and Standards:

In accordance with the provisions of Section 103 of the Water Resources Planning Act, P.L. 89-80, the Water Resources Council (WRC) developed a set of Principles and Standards to form the basis for formulation and evaluation of Federal water and related land resource projects. On September 10, 1973, the WRC published the Principles and Standards as approved by the President in the Federal Register. These became effective October 25, 1973, and replaced the policies established by Senate Document 97 which had provided guidance since 1962. (166)

A fuller discussion of the Principles and Standards is contained in a later chapter. For consideration here it needs to be noted that the basic areas of concern regarding the Principles and Standards are:

- Two equal planning objectives - national economic development objective and environmental quality objective;

- A system of four accounts to be developed during the planning process - the National Economic Development Account, the Environmental Development Account, the Regional Development Account, and the Social Well-Being Account;

- Discount rates to be established in accordance with the cost of Federal borrowing;

- New plan formulation procedures which provide for developing alternative plans, one which optimizes the national economic development objective, and one which emphasizes contributions to the environmental quality objective. (Trade offs between the two plans are then made until the recommended plan is acceptable to the greatest number of people.);

- The grandfather clause which provides for bringing the large number of plans under way into conformance with the Principles and Standards. (The phase-in period was to extend to January 1, 1975, but was later extended to January 1, 1976. After that date all plans were to comply fully with the requirements of the Principles and Standards.)(167)

6. Agreement between the SCS and Corps of Engineers, with Respect to Flood Protection by Engineering Works:

This agreement is not a problem but rather an action taken to resolve a problem of over-lapping responsibilities between the two agencies. While SCS is limited by law as to how far downstream it can go with its program, the Corps has no limit as to how far upstream it can go. This area of overlap became more critical in river basin planning activities than in project planning. Therefore, on September 23, 1965, D. A. Williams, Administrator, SCS, and William F. Cassidy, Lt. Gen. U. S. Army, Chief of Engineers, entered into an agreement to define more clearly the area of responsibility of each agency. (168)

Briefly, this agreement provided that:

- SCS would be responsible for protecting upstream (250,000 acres and less) agricultural flood plains and those upstream urbanized areas where flood problems of minor magnitude exist;

- The Corps would be responsible for flood protection for downstream agricultural flood plains and for urbanized areas where flood problems of major magnitude exist;

- Where a flood problem of intermediate magnitude exists in an urbanized area in an upstream watershed, the two agencies would reach an agreement on a case-by-case basis as to which one would provide the needed flood protection.

More specific details can be obtained from the complete agreement. (169)

The changes since 1969 have had a significant impact on the watershed program. This has been true not only in the time and commitments required for planning but also in other respects. In the early years, 1954-1969, the watershed program was really a peoples' program. The local people determined their objectives, the scale and scope of development desired, agreed to their level of commitment, and moved ahead with their program with Federal assistance. It was truly a Federally assisted program. Under later developments, particularly the Principles and Standards and NEPA, outside influences have a significant impact on project formulation. Often they are not aware of local needs, local conditions, and local ability to pay.

Heavy public involvement of a local nature is desirable in the watershed planning process. However, the wide open arrangements of the present procedures do give rise to some pertinent questions:

- Should individuals or organizations from outside a region be able to impact decisions for which they have no financial or moral obligations for implementing?

- Should local groups which refuse to participate in project development and operation be able to impose financial and moral obligations on project sponsors which are beyond their wishes and their ability to pay?

Changes in the watershed protection program in the last several years are moving this program rapidly toward a Federal rather than a Federally assisted program. In the long run, is this in the best interest of most of the people of the Nation?

Watershed Operations

When a watershed project is approved by resolutions of the appropriate committees of Congress it moves into the operations phase. The land treatment program to protect the watershed can be accelerated

**PROJECTS COMPLETED
CUMULATIVE BY YEARS**

**PROJECTS APPROVED FOR OPERATIONS
CUMULATIVE BY YEARS**

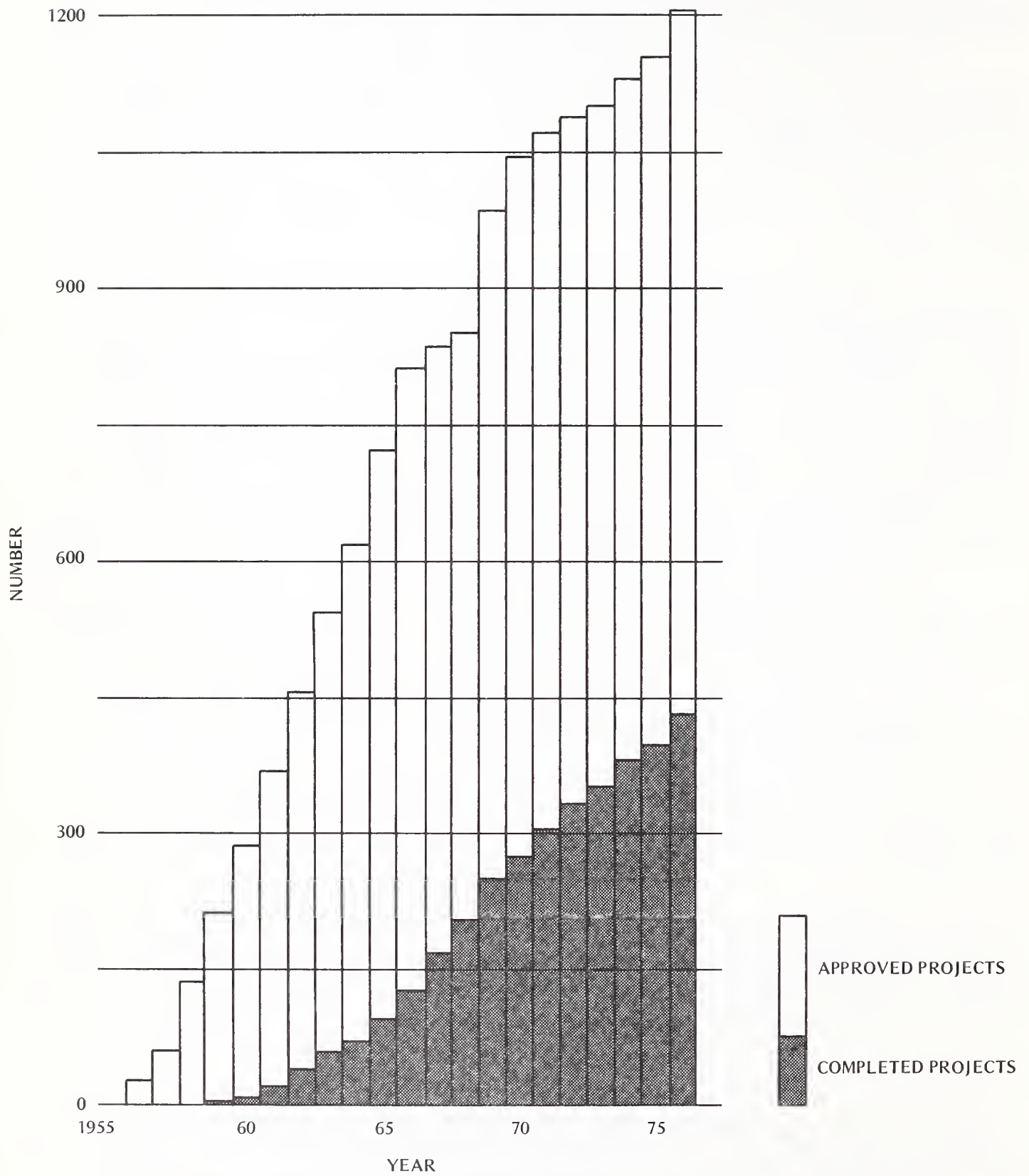


FIGURE 5

USDA OBLIGATIONS
WATERSHED PROTECTION OPERATIONS
ANNUAL

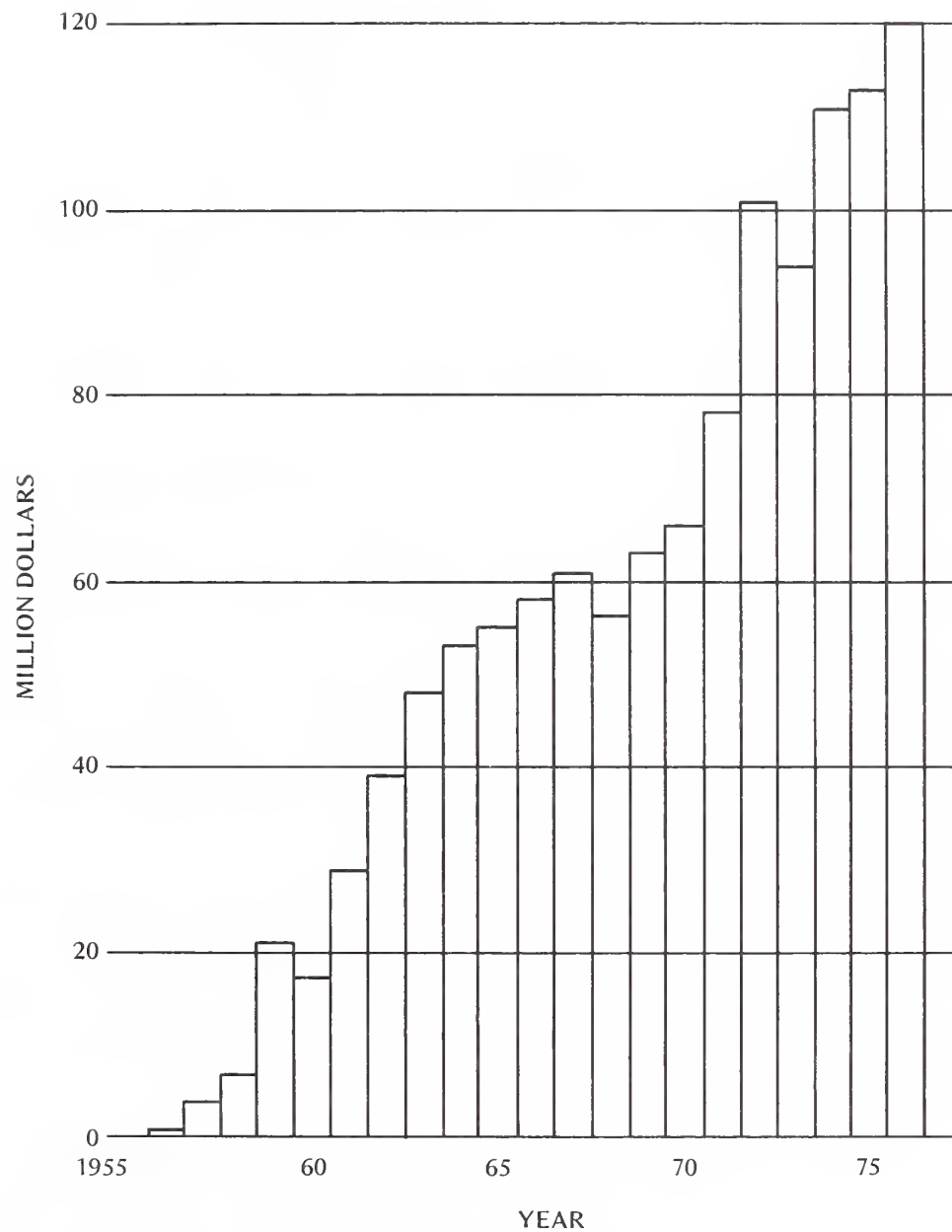


FIGURE 6

in accordance with the plan, and structural measures can be installed.

Local sponsors must provide the necessary land rights for each structural measure and have available their share of the construction costs as specified by the plan. An operation and maintenance agreement must be signed by the responsible parties. Engineering designs and specifications must be developed for each structural measure, invitations to bid advertized, and contracts let. Then construction must be supervised and a final report issued to show the measure has been installed as planned.

In the early phases of the program most land rights were granted to the sponsors. Now these often have to be purchased and, on occasion, condemnation procedures have to be followed. Demands for public access to all impoundments are becoming more common. When recreation is a planned purpose, public access is provided. Where single-purpose flood water retarding structures are constructed, public access normally is not provided. The landowner who usually continues to hold title to the structure site is not equipped to deal with the public. He has no means of providing supervision, safety and health measures, garbage and trash disposal or policing the area. The public frequently is inconsiderate of property rights and in some cases deliberately destroys property including livestock. So this demand becomes a sensitive and serious problem.

Some hunters, fishermen, and water recreation enthusiasts seem to think, because taxpayers' money is used for financial assistance, that the public owns and should have full access to the detention sites. A study made by the House Agriculture Committee several years ago showed that every sector of the National economy is subsidized to some extent by tax dollars. If the rationale for this argument used for public access to detention sites is valid, then it might be argued that the public should have access to every FHA or VA financed house, since their purchase is subsidized by tax dollars. This condition would hardly be condoned by the homeowners, just as access to privately owned detention sites is not welcomed by landowners.

By April 1, 1977, 1,185 watershed projects had been approved for operations. (170) Including major supplements as separate plans, this figure exceeded 1200. (Figure 5) Of this number 434 projects had been completed and operational activities were under way on the remaining 751 projects. Progress by years for both approved projects and completed projects is shown in Figure 5.

During the operations period (1956-1976) the USDA has obligated \$1,221,258,610. SCS obligated \$1,205,218,428 or 98.7 percent; Forest Service obligated \$12,893,601 or 1.1 percent; ERS, \$1,764,244 or about 0.1 percent; and Department of the Interior agencies have obligated \$1,382,255 or about 0.1 percent. Annual obligations are shown in Figure 6. (171)

All 1,185 watershed projects contain watershed protection as a purpose and 1,171 of these include flood prevention as a purpose. In this sense all but 14 projects are multiple purpose. However, SCS usually considers watershed protection and flood prevention as a single purpose since these purposes are so closely related. Drainage is a purpose in 282 projects; irrigation in 89; rural water supply in 2; recreation in 247; fish and wildlife in 89; municipal and industrial water supply in 152; and water quality management in 1. (172) Of the projects completed, drainage, recreation, municipal and industrial water supply, fish and wildlife, and irrigation are the most popular other purposes, in that order. There are 643 multiple purpose projects approved. This is over 54 percent of the total number.

Problems

The major problems affecting the Watershed Operations program are the more sophisticated designs for the major structural measures. These will be discussed by measures.

1. Dams

Early floodwater retarding structures were limited to 5,000 acre feet total storage and were single purpose. P.L. 1018 increased the total storage to 25,000 acre feet but held flood detention storage to 5,000 acre feet. Later allowable flood detention storage was increased to 12,500 acre feet. Allowable storage for irrigation, recreation, municipal and industrial water supply, rural water supply and water quality management increased the volume of permanent storage, when included in a specific site.

Initial designs provided for corrugated pipe principal spillways and a 35 to 50-year life of structure. Larger dams and multiple purposes required carefully designed concrete or steel principal spillways and 100-year life structures. Hydraulically efficient dams required larger capacity principal spillways to reduce dewatering time. However, protection of flood plains from flooding by more frequent storms required lower release rates or larger channels. This required the use of two-stage inlets for many principal spillways in order to hold down channel sizes and provide more efficient dams. During the more recent years, dam safety has become a matter of national concern. This has required even further attention to dam design and construction.

As the planner, designer, and inspector of construction, SCS has an obligation to see that dams installed under its various program authorities are safe. Its plans and designs are based on geologic and hydrologic information pertinent to each specific site and the planned structure use. Designs are developed using the best available hydrologic and hydraulic information. Inspectors ensure that embankment material is suitable, placed, and compacted in accordance with design specifications, and that appurtenant structures are constructed as designed. (173)

Since SCS has no legal maintenance responsibility, its planning and design criteria are based on the assumption that minimum reliance on maintenance is the most economical design over the life of the structure. In the project programs each dam is inspected every three months during the first year. It is also inspected after each major storm or occurrence that might have adversely affected the structure, with a minimum of at least one annual inspection. (174)

The safety record of SCS project type dams is excellent. Failures from all causes have amounted to less than 0.5 of 1 percent.

In carrying out its many programs, the SCS has a part in the construction of more dams each year than any other agency - Federal, state or international. In the spring of 1972, SCS listed over 1,400 dams with the U. S. Committee on Large Dams. Of this number 645 had heights in excess of 50 feet. (175) This is considerably more large dams than have been built by any other agency in the world.

Woodward-Clyde Consultants stated that it is vital to their study to recognize that the dams constructed with SCS involvement are many in number but vary widely in potential hazard. (176) At the close of the 1976 fiscal year SCS had been involved in the construction of 2,566,615 various types of dams. These are classified as follows:

<u>Type</u>	<u>Number</u>
Multipurpose	9,014
Floodwater retarding structures	12,703
Total detention type structures	21,717
Debris basins	78,761
Grade stabilization structures	283,104
Irrigation pits or regulating reservoirs	49,418
Irrigation storage reservoirs	40,524
Ponds	2,093,091
Total	2,566,615 (177)

The highest SCS dam in service is 150 feet high. However, there is one in the planning stage that will be 200 feet high. It is estimated that well over 25,000 SCS-assisted structures are over 15 feet in height. (178)

2. Channels

When the Watershed Protection and Flood Prevention program was started in 1954, SCS engineers probably had had more experience with the design and construction of channels than any other major watershed work of improvement. The Service had been providing technical assistance on farm drainage since the 1930's. USDA agencies evidently had been involved in drainage research since about the turn of the century. In 1898, irrigation investigations were authorized by Congress under the Office of Experiment Stations. In 1902, the Division of Soils was organized into the Bureau of Soils. Research on water problems in agriculture was

emphasized. (179) In 1926, C. E. Ramser discussed drainage ditch conditions in 1924 - 1926. (180)

On December 3, 1938, by Secretary's Memorandum 799, Secretary H. A. Wallace assigned to H. H. Bennet drainage responsibilities previously held by the Bureau of Agricultural Engineering. The Service was already involved in drainage work and had been since establishment of CCC camps. CCC drainage camps assigned to SCS in 1935 were already working with organized drainage enterprises and associations. (181) So by 1954 SCS engineers were well acquainted with the design and construction of drainage channels.

Drainage run-off curves were developed from the formula

$$Q = C M^{5/6}$$

where Q = run-off in cubic feet per second

C = drainage coefficient

M = drainage area in square miles

Drainage coefficients had been established for different conditions based on some research and a wide range of experience. These were followed carefully by all drainage engineers and became the basis for project channel design. It soon became evident that they were not adequate for multiple purpose channel design. An analysis in the Southeast showed that a drainage channel designed on the coefficient for the Mississippi delta would provide a one-year level of flood protection to that area, while one designed on the coefficient for the Atlantic Coastal Region would provide a five-year level of protection in North Carolina. This was because of the wide variance in hydrologic soil groups and soil-cover complex conditions.

Agreement was finally reached in the Southeast Region to design multiple purpose channels to handle the desired level of flood flows under bank-full conditions, then check the channel to be sure it had the required drainage capacity with the hydraulic gradient at least one foot below the average bank elevation.

The current Drainage Handbook includes consideration of hydrologic soil groups and soil-cover complex conditions in the selection of the proper value for "C". (182)

Another factor in channel design which has received greater attention in the last 10 to 15 years has been the question of Channel Stability. Recommended procedures for designing stable channels are given in SCS, Engineering Division, Technical Release No. 25, Planning and Design of Open Channels.

The controversy over environmental damage resulting from channel modification also has had its effect on channel installation. However, when it is recognized that approximately 100 million acres of the best cropland in the nation (or about one-fourth of it) has excess water problems (183), it becomes imperative that adequate drainage outlets be provided.

As of June 30, 1976, SCS had given assistance in the construction of 16,971 miles of open channels. (184) Of these, 9,927 miles had been constructed under the watershed programs. (185) In addition to these open channels, SCS had assisted, through all its programs, in the installation of 388,810 miles of main farm drainage ditches and laterals.

Summary

The SCS watershed programs have been very popular with farmers and rural communities throughout most of the nation. In some areas, some elements such as channelization, have been quite controversial among special interest groups.

Watershed projects have had a profound impact on local rural economies, stability of crop production, local water supplies, local recreational opportunities, improved living environment, local health and safety conditions and local flood protection. Opportunities for local employment have been greatly increased as a result of local industrial development made possible by dependable municipal and industrial water supplies for small towns and local flood protection.

There is still a great need for watershed program assistance as reflected by the Conservation Needs Inventory (186) and the back log of unserved applications. (187)

CHAPTER 5

USDA RIVER BASIN STUDIES

Organization

Section 6 of P.L. 566 authorized the Secretary of Agriculture, in cooperation with other Federal, state and local agencies, to make investigations and surveys of the watersheds of rivers and other waterways as a basis for the development of coordinated programs. In Secretary's Memorandum 1325, April 1, 1953, the Secretary of Agriculture had assigned the responsibility for administration of USDA water resource programs to SCS. (188) Title I, Administrative Regulations of the Department of Agriculture, assigned various responsibilities for this activity among other agencies of the Department. These responsibilities were identified in a Memorandum of Understanding between the Soil Conservation Service, Economic Research Service, and Forest Service. This Memorandum is recorded in SCS River Basins Memorandum 2 (Rev. 1), dated May 6, 1968.

The major responsibilities of the participating agencies are stated briefly as follows: (189)

1. SCS

a. Administration of USDA activities in connection with river basin investigations, preparation of reports, and development of general principles, criteria and procedures;

b. Make physical appraisals of agricultural and rural water problems and resource development needs, and define them in terms of meeting regional and community economic needs for water-related goods and services;

c. Determine the development potential of upstream watershed projects, the scope and scale of development needed, and coordinate this potential with other proposals for development;

d. At National level, SCS, with ERS and FS assistance, participates in program formulation and coordination with the Water Resources Council and member agencies;

e. SCS, with ERS and FS, participates with other agencies in WRC activities.

2. FS

a. Aspects of river basin planning related to woodlands and forest lands, Federal and non-Federal, and rangelands within and adjacent to the National Forests which are administered by the FS;

b. Analyses and projections of economic activity related to multiple uses and products from forest, woodlands, and wild lands,

and interpretations of these projections with respect to use and requirements for water and related lands;

c. Appraisal of suitability and capability for forested lands to satisfy future demands for products and services, and determination of kinds, amounts, and costs of watershed practices needed on forest lands;

d. Estimates and evaluations of the impacts of water resource development plans upon forest resources.

3. ERS

a. Basin-wide economic aspects and elements of USDA program in comprehensive river basin planning;

b. Development and analyses of agricultural economic base of river basin studies to include appraisal of trends in land and water use;

c. Development of projections of agricultural production, employment, income, rural population, and land use for the economic analysis of agricultural water management, needs, and potentials;

d. Analyses of economic impact of flood prevention, land drainage, irrigation, and other water development programs on production, employment, and income in agricultural and related sectors of the economy;

e. Evaluation, with Bureau of Outdoor Recreation and other agencies, of the demand for and economic benefits of water-based recreation developments needed in river basin investigations.

Coordination of planning activities is effected through the use of advisory committees. The Washington Advisory Committee (WAC) coordinates all USDA river basin planning activities at the National level. It is composed of a member from SCS (chair agency), ERS, and FS. When any proposal affects the interests of the Farmers Home Administration, Rural Electrification Administration, Agricultural Research Service, and/or Agricultural Stabilization and Conservation Service, representatives of these agencies are invited to participate. The duties of the WAC are: (189)

1. Provides coordination and oversight of all USDA river basin activities;

2. Reviews USDA planning activities, develops planning procedures, and recommends needed administrative adjustments;

3. Formulates USDA guidelines, standards and instructions;

4. Reviews and evaluates survey proposals and recommends new planning starts;

5. Reviews and coordinates agency funding requirements (SCS is responsible for budgeting and requesting USDA funds for river basin planning activities);

6. Reviews and recommends approval of USDA plans of work for proposed studies and USDA reports of completed studies;

7. Provides other coordination needed.

The Field Advisory Committee (FAC) is composed of representatives of SCS, ERS, and FS. The SCS State Conservationist responsible for the study chairs the FAC. Usually the sponsoring State agency is invited to attend and participate in FAC meetings. These are held at least quarterly. In some states the sponsoring state agency sets up its own coordinating committee and gives active leadership to the study. In these cases the FAC members meet with this committee and usually hold a separate meeting before or after the State meeting. This arrangement is compatible with the FAC concept since its responsibilities are for intra-Departmental coordination. The duties of the FAC are: (189)

1. Field coordination of USDA agency activities;
2. Field liaison with state and other Federal agencies, when needed;
3. Preparation of survey plan of work;
4. Interpretation of National guidelines as they pertain to local study;
5. Field budget recommendation;
6. Make periodic and special reports;
7. Field guidance of USDA aspects of interagency coordination and program recommendations; and
8. Other coordination as needed.

Cooperative Comprehensive River Basin Studies

These studies initially were called Type 4 studies to differentiate from Type 1, interdepartmentally coordinated comprehensive framework studies, Type 2, interdepartmentally coordinated comprehensive detailed studies, and Type 3, specific project studies. They are made as a cooperative effort between USDA and a State or another Federal agency. (190)

Generally, these cooperative studies involve specific objectives of the sponsoring organization and of the USDA. They usually concentrate on recognized water-resource problems of the State concerned and on analyses of the potentials for P.L. 566 watershed projects to meet identified needs. (191) The studies are initiated at the request of the sponsoring agency, State or Federal. No specific level of funding from the sponsor is required. In fact, many studies are made without sponsor contribution except in study inputs. On the other hand, some sponsors have made major financial contributions.

The major objectives of each study are to identify and determine the nature of water and related land resource problems; determine a rational means of alleviating these problems; and identify the relative timing in which the needed activities should be initiated. The study will further identify those USDA project-type and related programs which can be used effectively to meet the needs for water-related goods and services in the river basin and to ensure that agricultural interests are identified and protected in any overall water and related land resource development program. (192)

During the last few years interest has been developing in USDA studies which emphasize analyses and solutions to individual problems or needs. When such conditions exist there is no need to spend the time and money to examine a broad range of rural and agricultural problems and needs. Some examples of such studies are specific needs in one problem area, such as for a state water plan, salinity studies in the western states, a study of special erosion and sedimentation problems in such areas as the Palouse area of south-eastern Washington. The increasing state water quality planning efforts under Section 208 of P.L. 92-500 and state land management decisions are expected to put more emphasis on these specialized river basin studies.

In the period 1969 - 1970 the Water Resource Council stopped using the terminology Type 1 and Type 2. Therefore, USDA stopped using the Type 4 designation and now refers to these studies as Cooperative River Basin Studies (CRBS).

Through fiscal year 1977, 59 Type 4 and CRBS studies had been completed and 50 such studies were under way. (193) A field survey made during the summer of 1976 showed that the following uses have been made of data developed and presented in these studies:

- Over 100 basin studies have provided input for state water plans;
- Coastal Zone Management plans have utilized data from about 25 studies;
- More than 300 state, regional, and county land use plans have relied heavily on basin study data;
- Data from basin studies are being utilized in the Section 208 planning process in almost all states when it is available;
- Basin studies have provided information for more than 50 wild and scenic river studies;
- Basin study data have facilitated the preparation of over 100 environmental impact statements;
- Almost 300 conservation districts have based parts of their long range programs on information provided by basin studies;
- Basin studies have provided data for the National Water Assessment, CCJP's, and other national water resource planning efforts of the Water Resources Council; and
- Over 100 consultants and/or regional, county or city planning commissions have utilized the water supply inventory supplied by basin plans.

In addition, these basin studies have provided information and analyses which have led to decisions to initiate;

- over 50 special studies;
- almost 130 P.L. 566 projects;

- over 900 RC&D measures;
- about 35 wild and scenic river proposals;
- almost 20 flood hazard studies.

Other decision impacts resulting from cooperative river basin studies include:

- Development of forest management guidelines to control sediment;
- Changes in some state standards for flood protection;
- Changes in proposed highway and pipeline locations to protect natural resources;
- Implementation of state reservoir site-acquisition programs;
- State flood plain management laws and regulations;
- Erosion and sediment control ordinances;
- Land use development plans;
- Changes in scope of P.L. 566 and CE projects;
- Deauthorization of some P.L. 566 and CE projects;
- Data for Sec. 303 e basin plans developed by private consultants;
- County-wide drainage plans;
- Water quality monitoring programs;
- State wetland management programs;
- Community water supply developments;
- and many others.

Examples:

1. Among the first Type 4 studies were two sponsored by the Corps of Engineers. Both of these were started in 1957.

a. The Delaware River Basin:

The Corps of Engineers was authorized to make a study of the Delaware River Basin by the Flood Control Act of 1948 (P.L. 80-858) as amended by the Flood Control Act of 1950 (P.L. 81-516) and the Flood Control Act of 1956 (P.L. 84-685). SCS was requested to assist in the study under the provisions of Sec. 6, P.L. 566. Appendix G to the "Report on the Comprehensive Survey of Water Resources of the Delaware River Basin", December 1960, was prepared by USDA. Appendix H, "Fluvial Sediment", was prepared by USGS and SCS, and Appendix R, "Water Control at Intermediate Upstream Levels", was prepared by a Joint Work Group of Corps of Engineers and SCS. This appendix visualized the use of existing Corps of Engineers and SCS authorities to install the needed upstream measures.

b. Potomac River Basin:

The authority of the Corps of Engineers to make this study was a Resolution of the Senate Public Works Committee of January 26, 1956, which requested a review of a previous report on the Potomac River and Tributaries published as House Document No. 622, 79th Cong., 2nd Session.

The Corps requested USDA participation under the provisions of Sec. 6, P.L. 566. USDA developed a watershed protection and management program for the Basin and worked with the Corps in the study of an up-stream reservoir system. The Department also supplied data on the current and projected agricultural and rural water use, use and conditions of the land and cover of the Basin subwatersheds, and an estimate of sediment yields by subwatersheds. It also prepared economic projections of farm acreage and land productivity. The results of this study are stated concisely in the Syllabus of the Report:

"A plan for flood control, water supply, quality control and recreation which would include 418 headwater reservoirs, 16 major reservoirs, 3 small flood control projects already authorized under Public Law 685; treatment of all wastes entering the Basin's streams by 2010.....; and land management and conservation measures to reduce erosion and rapid localized runoff." (194)

2. Joint Studies with the Corps of Engineers.

While Sec. 6, P.L. 566 authorized the Secretary of Agriculture to cooperate with the Secretary of the Army in making river basin studies, there was no authority for a joint study and joint report until the Smith Act was passed in 1962. This Act authorized and directed the Secretary of the Army and the Secretary of Agriculture to make joint investigations and surveys in accordance with existing authorities and to prepare joint reports setting forth their recommendations for the installation of the works of improvement needed for flood prevention, or the conservation, development, utilization and disposal of water, and for flood control and allied purposes. Such action could be initiated only after authorized by resolutions adopted by the Senate or House Public Works Committees. (195)

There have been only six joint studies directed under this authority:

- a. The Restudy of the Cape Fear River Basin, North Carolina, (1957 - 1975).
- b. San Gabriel River Basin, (1971 -).
- c. Pocatalico River Basin, West Virginia, (1972 -).
- d. Chickasaw Basin Joint Study, (1973 -).
- e. Upper Allegheny River Basin, New York, (1974 -).
- f. Minnesota River, (1975 -).

Of these, implementation action has resulted from only one study. A partial report dealing with upstream flood prevention and water supply storage in the Pocatalico River Basin has been authorized for implementation.

3. U. S. Study Commission surveys.

- a. U. S. Study Commission, Southeast River Basins:

The study was authorized by P.L. 85-850, August 28, 1958. The Act authorized an integrated and cooperative investigation to formulate a comprehensive and coordinated plan for:

- (1) flood control and prevention;
- (2) domestic and municipal water supplies;
- (3) improvement and safeguarding of navigation;
- (4) reclamation and irrigation of land, including drainage;
- (5) possibilities of hydroelectric power and industrial development and utilization;
- (6) soil conservation and utilization;
- (7) forest conservation and utilization;
- (8) preservation, protection and enhancement of fish and wildlife resources;
- (9) development of recreation;
- (10) salinity and sediment control;
- (11) pollution abatement and the protection of public health; and
- (12) other beneficial and useful purposes. (196)

The basins covered by the survey are: Savannah, Altamaha, Saint Marys, Apalachicola-Chattahoochee, and Perdido-Escambia River Basins (and intervening areas) in the States of South Carolina, Georgia, Florida and Alabama. (197)

The Act established a commission to be known as the United States Study Commission on the Savannah, Altamaha, Saint Marys, Apalachicola-Chattahoochee, and Perdido-Escambia River Basins and intervening areas. It became known as the Southeast River Basins Study Commission. The Commission was composed of 11 members; a chairman; six members representing Federal departments (the Army, Commerce, Health, Education and Welfare, Agriculture, the Interior and the Federal Power Commission); and four members representing the states of South Carolina, Georgia, Florida and Alabama. (198)

The Department of Agriculture was represented initially by John Short, who was also the USDA member on the AWRBIAC. He was succeeded by Cecil Chapman, SCS State Conservationist, Georgia. USDA inputs were provided by AMS, ARS, ASCS, ERS, FmHA, FS, and SCS. SCS established a full time team in Athens, Georgia, which developed field data on a watershed and subwatershed basis.

The Study concluded that:

- (1) availability of land and water is not a limiting factor in development;
- (2) long-range needs related to land and water resources can be met;
- (3) all elements of the plan need not be developed at once;
- (4) flood damages are local problems;
- (5) ground and surface waters are of good quality and adequate for foreseeable needs;
- (6) waterway facilities can be expanded to meet projected increases in waterway traffic;

(7) an increase in farm drainage and irrigation is expected;

(8) hydroelectric facilities can meet only a small part of the projected demand;

(9) industrial development and utilization are key factors for the area;

(10) soil conservation and utilization programs included in the plan will meet 75 percent of the needs;

(11) accelerated forestry programs can meet projected production needs to 2000;

(12) projected user-days of hunting and fishing can be accomodated by the plan;

(13) recreational needs can be met;

(14) sediment can be controlled by conservation measures;

(15) additional waste treatment facilities are needed;

(16) beach erosion and hurricane damage potentials need further study;

(17) special cost-sharing by the Federal government was proposed for certain projects in the early action phases;

(18) additional basic data are needed; and

(19) a Resources Advisory Board for the area is needed. (199)

The Report of this study commission consisted of several volumes. It was published as H. D. No. 51, 88th Cong., 1st Session.

b. U. S. Study Commission, Texas River Basins.

The study was authorized by P.L. 85-843 (72 Stat. 1058) as amended by P.L. 86-228 (73 Stat. 456) approved September 8, 1959. The Act authorized an integrated and cooperative investigation study and survey to formulate a comprehensive and coordinated plan of the same scope as that directed for the Southeast River Basins. (200)

The basins covered by the survey are: Neches, Trinity, Brazos, Colorado, Guadalupe-San Antonio, Nueces, and San Jacinto River Basins and intervening areas. (201)

The Act established a commission to be known as the United States Study Commission on the Neches, Trinity, Brazos, Colorado, Guadalupe-San Antonio, Nueces, and San Jacinto River Basins and intervening areas. It came to be called the U. S. Study Commission - Texas. The Commission was composed of 16 members: a chairman; six members representing Federal Departments (the Army; the Department of Health, Education and Welfare, Agriculture, the Interior, Commerce and the Federal Power Commission); a member representing the Texas Board of Water Engineers; and eight members representing each of the eight river basins covered by the study. (202)

Study assignments were made to the SCS along with other Federal planning agencies. The SCS agreed to perform work required to integrate

soil and water conservation and the upstream flood prevention facilities of USDA with water resource and flood prevention facilities on the main stems and major tributaries of Study Area streams in the formulation of the intra-basin development plans. (203)

Specific Work Assignments included:

- (1) ERS-USDA
Projected Resource Requirements for meeting
Projected Needs for Agricultural Production, Texas River Basins.
- (2) SCS-USDA
 - (a) 1958 Land Use by Capability Class and Sub-class and Conservation Treatment Requirements for 1975 Expected Land Use for River Basins;
 - (b) Present Crop Yields, Acreages, and Land Use for River Basins and Land Resource Areas, Texas;
 - (c) Floodwater Retarding Structures: Rate of Construction and Surface Area of Sediment Pools by Years;
 - (d) Determination of Flood Hydrology for Economic Evaluation of Upstream Flood Prevention Projects;
 - (e) Irrigation Survey Report;
 - (f) Upstream Flood Prevention and Water Resources Development; and
 - (g) Drainage Survey Report. (204)

The Commission completed its study and prepared its final report in accordance with Sec. 209, P.L. 85-843, as amended. The Report was published in March 1962 in three parts, namely: Part I - The Commission Plan; Part II - Resources and Problems; and Part III - The Eight Basins.

4. Appalachia.

President Kennedy had a personal interest in and deep concern for social and economic conditions in Appalachia. After his inauguration an interagency study was made of the social and economic problems, needs, and opportunities of the region. This study resulted in proposed legislation which was passed as The Appalachian Regional Development Act of 1965, P.L. 89-4, March 9, 1965. USDA made significant contributions to the study with SCS and ERS providing most of the USDA effort.

Section 206 of the Act states in part:

"The Secretary of the Army is hereby authorized and directed to prepare a comprehensive plan for the development and efficient utilization of the water and related resources of the Appalachian region, giving special attention to the need for an increase in the production of economic goods and services within the region as a means of expanding economic opportunities and thus enhancing the welfare of its people, which plan shall constitute an integral and harmonious component of the regional economic development program authorized by the Act." (205)

In response to this directive, the Corps of Engineers, with other Federal, state and local, and private agency cooperation, made a survey of the water and related resources problems and potential developments of the region. Its report "Development of Water Resources in Appalachia" was published in December 1969. The Main Report was divided into six parts, 15 volumes. The Appendices involved another 10 volumes. (206)

This survey was unique in that it set forth regional growth as a principal objective. Normally, water resource developments are evaluated on National economic benefits. Regional development and regional benefits are given only secondary consideration. However, in this study, Congress was interested in regional growth and development without concern of the impacts they might have on other regions. (207)

Part IV, Vol. 12, of the Main Report, presented the special evaluation procedures developed and used for project evaluations. This discussion also presented several methods that can be employed to analyze the expansion effects (job-producing potential) of water resource developments. (208)

USDA prepared a report on the soil, timber, and water resources of Appalachia from the standpoint of agriculture and conservation interests. Modifications of the going programs administered by various agencies within USDA were proposed. The Forest Service was requested to update and present its plans for accelerating recreational facilities development in the 15 National Forests of Appalachia. (209)

For each of the 13 states which lay within or partially within the Appalachian Region USDA agencies provided the following information:

a. SCS

(1) Upstream Watershed Projects Completed or in Operation.

(2) Upstream Watershed Projects Authorized but needing acceleration for Early Action Program.

(3) Upstream Watershed Projects planned but which should be authorized and accelerated for Early Action.

(4) Upstream Watershed Projects which should be planned and installed under an accelerated program before 1990.

(5) Land treatment measures which should be installed or applied under an accelerated program by 1980.

b. FS

(1) An accelerated land treatment program in the National Forests.

(2) An accelerated recreation development program in the National Forests. (210)

Another unusual feature of this report is the Royalton Reservoir-Salyersville Area Interagency Project proposal. It would consist

of (1) the proposed Royalton Reservoir, and a local protection project on Licking River and State Road Fork near Salyersville to be installed by the Corps, (2) three small tributary structures to be installed by SCS, and (3) accelerated land treatment on 44,400 acres to be applied under direction and assistance by USDA agencies. (211) This is one of the few jointly planned and evaluated structural systems by the Corps and SCS which have been proposed.

There are ingrained objections within the Federal establishment to the use of regional development objectives and regional development benefits in water resource project formulation and evaluation. These have prevented proposed project construction and the resulting benefits as visualized in P.L. 89-4 and the Water Resource Development Report.

5. Critical Water Problems Facing the Eleven Western States - Westwide Study.

In addition to the Corps of Engineers, US Study Commissions, and States, USDA has cooperated with the Department of the Interior in water resource studies under the provisions of Sec. 6, P.L. 83-566. The Colorado River Basin Project Act (P.L. 90-357) September 1968, directed the Secretary of the Interior to conduct reconnaissance investigations for the purpose of developing a general plan to meet the future water needs of the 11 Western States lying wholly or in part west of the Continental Divide. (212)

The Westwide Study represents the joint efforts of representatives of the 11 Western States and 43 other organizations, including Federal Departments and independent agencies, commissions representing regional and national interests, and nongovernmental organizations. Within the Federal Departments there were 12 separate agencies involved. The agencies of the Department of Agriculture which contributed to this effort are ERS, FS, and SCS. The Bureau of Reclamation of the USDI was the lead agency for the study. USDA agencies participated in both the Management and Implementation Groups. (213)

A final reconnaissance report was to be submitted to the President, the Congress, and the Water Resources Council no later than June 30, 1977. (214) However, new national priorities emerged after passage of the authorizing legislation. Satisfaction of national energy and food and fiber needs and emerging land use policies, together with the protection and enhancement of the environment, placed new demands on planning for the development of the resources of the Western States. Consequently, the Westwide Study was administratively redirected in January 1973 to identify by July 1, 1974, only the most pressing and immediate water and related land resource needs. (215)

The Westwide Study was designed initially (1) to produce a general plan to meet the future water needs of the 11 coterminous Western States, (2) to be interdisciplinary in character, and (3) to be inter-agency in participation and direction. (216)

When the Department of the Interior contacted the USDA regarding its participation in this study, USDA agreed to place an interagency team in residence at the Study Headquarters in Denver, Colorado. The USDA team consisted of a team leader (furnished by SCS), SCS, ERS, and FS personnel. The team also could call on USDA field personnel from the several states for inputs pertaining to their respective states. This arrangement proved quite satisfactory. USDA made significant and pertinent inputs regarding soil and water resources as they pertain to agricultural and forestry problems and potentials in the Westwide area. Its specific inputs are reflected in such studies as: projections of agricultural production; agricultural water needs and demands, including irrigation; erosion and sedimentation problems; salinity problems; impacts of wilderness areas on water planning; wild, scenic and recreational river requirements; and the effects of conservation and reuse on meeting water demands.

The study concluded that, from the National viewpoint, the order of priority of the most critical water and related problems in the 11 Western States is: (1) Municipal and Industrial Water Supplies, (2) Energy Development, (3) Environmental Protection and Enhancement, and (4) Agriculture and other Development Programs. (217)

6. State and Local Cooperative Studies

No specific examples of these studies will be discussed in this document. These studies constitute by far the majority of the cooperative River Basin Studies. The impact and use of these studies have been summarized in the first part of this chapter. The ability of the sponsoring agencies to have a major influence on the scope and scale of these studies and to participate effectively in their management contributes to their popularity and effectiveness.

Figure 7 reflects the degree of participation of USDA in these studies. While these figures also reflect USDA participation in the interagency river basin studies, the major part of this effort now is directed into the Cooperative Studies. The record of obligations as summarized by SCS makes it difficult to separate out obligations by types of studies. The 1978 fiscal year Appropriations Act keeps the annual level for this activity above \$15,000,000.

The location and identification of completed cooperative River Basin Studies as of June 1976 are shown on Plate 1. The same information for studies in progress as of June 1976 is shown on Plate 2.

USDA OBLIGATIONS
RIVER BASIN PLANNING
ANNUAL

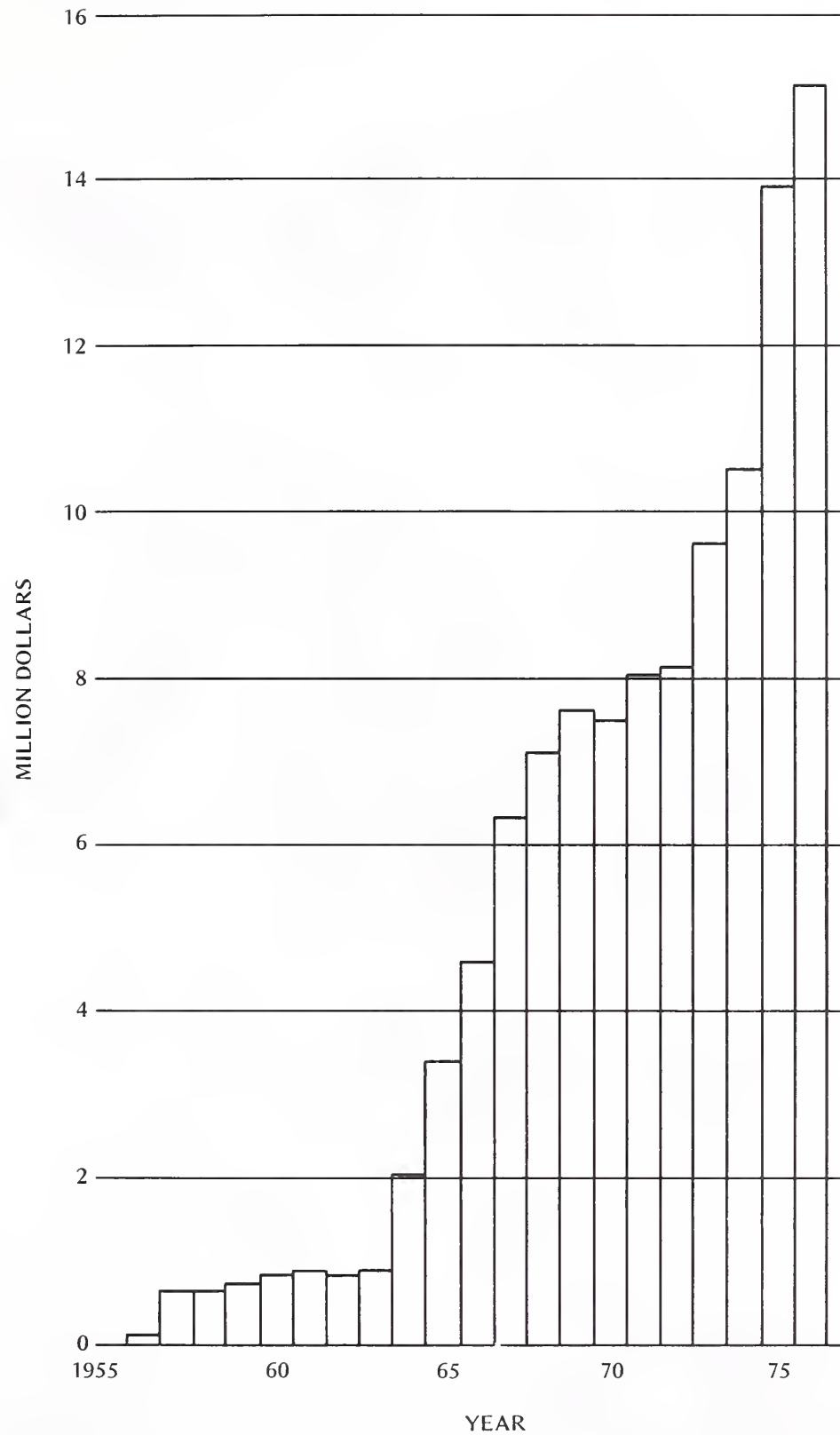
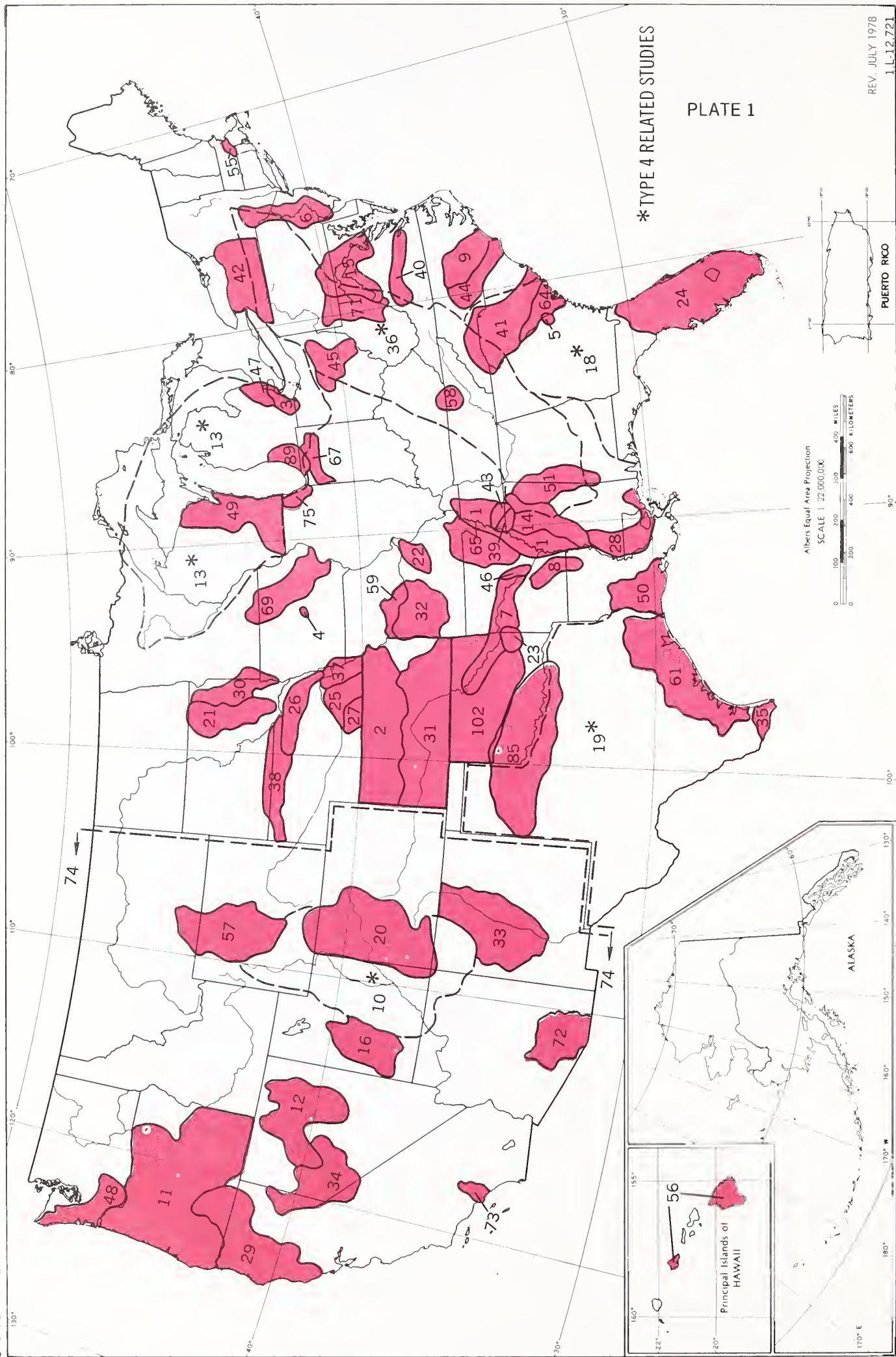


FIGURE 7

(Type 4)

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



REV. JULY 1978

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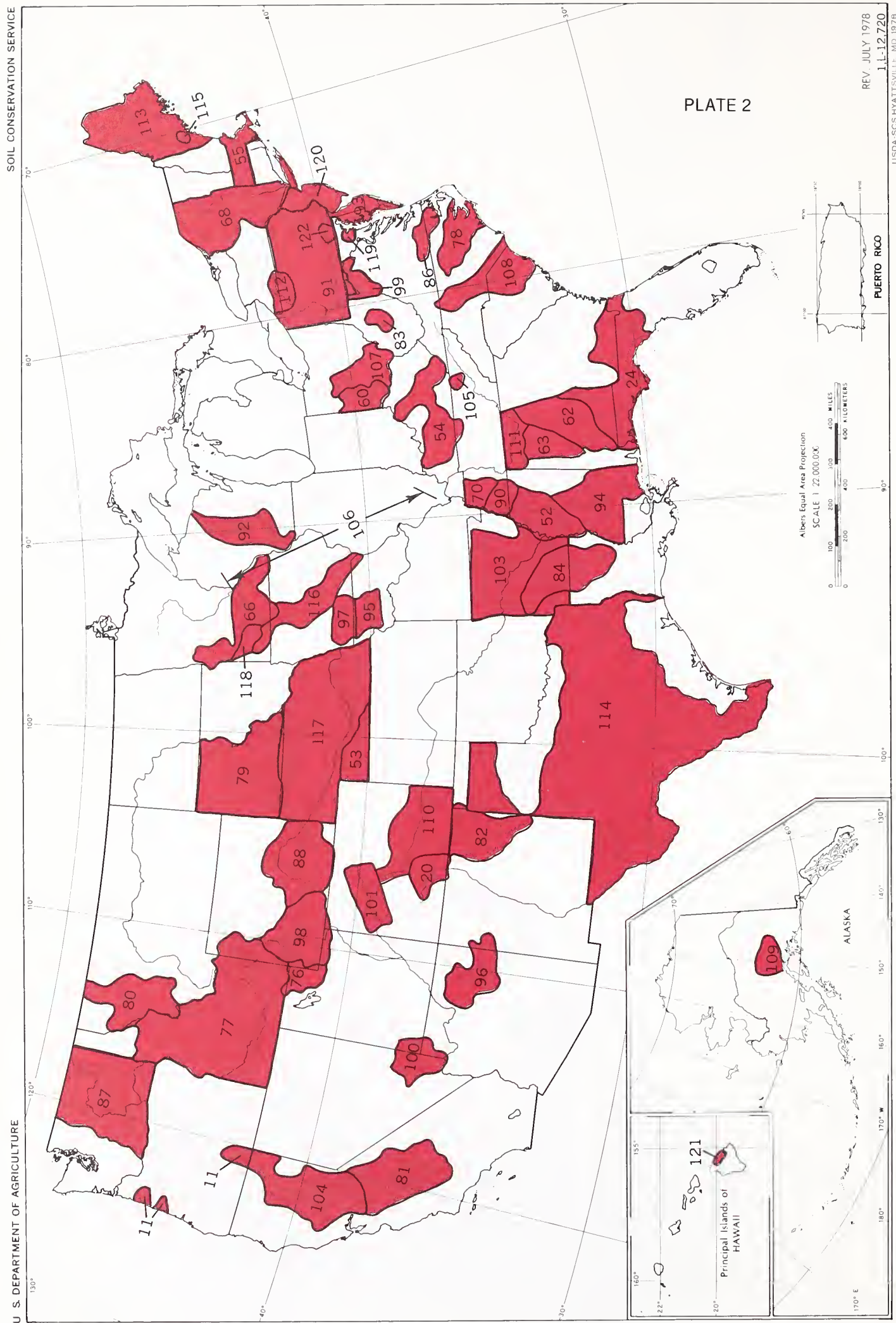
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COOPERATIVE RIVER BASIN SURVEYS
Completed as of July 1978

STUDY NAME	STATES COVERED	STUDY NAME	STATES COVERED
1. Lower Mississippi River & Tributaries	MS, AR, IL, LA, MO	27. Little Blue River Basin	NE
2. Kansas River Basin in Kansas	KA	28. Coastal & Independent Streams River Basin	MS, LA
3. Huron River Watershed	MI	29. North Coastal River Basins	CA, OR
4. Des Moines River - Red Rock Reservoir	IA	30. Big Sioux River Basin	SD, IA, MN
5. Savannah River - Hartwell Dam	SC	31. Arkansas River Basin in Kansas	KS
6. Delaware River Basin	PA, DE, NJ, NY	32. South Grand-Osage River Basin	MO
7. Arkansas Multiple-Purpose Project	AR, OK	33. Upper Rio Grande Basin	NM
8. Bayou Bartholomew	AR, LA	34. Central Lahontan River Basins (2 Subbasins)	NV, CA
9. Cape Fear River Basin	NC	Walker River Basin	
10. Colorado River Storage Project*	UT, AZ, CO, NM, WY	Carson River Basin	
11. Oregon Rivers (17 Subbasins)	OR	35. Lower Rio Grande Basin	
Middle (Central) Willamette River Basin		36. Appalachian Water Resources Study*	
South Coast (Coos-Coquille) Drainage Basin			
Deschutes River Basin*		37. Nemaha River Basin	TX
Hood Drainage Basin		38. Niobrara River Basin	WV, AL, GA, KY, MD MS
John Day River Basin		39. Chickasaw-Metropolitan District	NC, NY, OH, PA, SC, TN, VA
Lower Willamette River Basin		40. James River Basin	NE, KS
Malheur Lake Drainage Basin		41. Santee River Basin	TN
Middle Coast Drainage Basin		42. Western New York River Basin	VA
North Coast Drainage Basin		43. Hatchie River Basin	SC, NC
Powder Drainage Basin		44. Cape Fear River Basin Restudy PL. 87-639	NY
Umatilla Drainage Basin		45. Muskingum River Basin	TN, MS
Upper Willamette River Basin*		46. Bayou Meto Basin	NC
Klamath Drainage Basin		47. Southeast Michigan Rivers Basin	AR
Rogue-Umpqua River Basin		48. Southwest Washington Rivers Basin	MI
Malheur-Owyhee Rivers Basin		49. Southeast Wisconsin Rivers Basin	WA
South Coast River Basin		50. Southwest Louisiana Rivers Basin	WI
Grande Ronde River Basin		51. Tombigbee River Basin Restudy	LA
Humbolt River Basin	NV	55. Massachusetts Water Resources Study (1 Subbasin)	MS, AL
13. Upper Mississippi River - Great Lakes*	MO, IL, IN, MI, OH, WI	Charles Study Area	MA
14. Yazoo-Mississippi River Basin	MS	Hawaiian Rivers (2 Subbasins)	HI
15. Potomac River Basin	VA, MD, PA, WV	Island of Hawaii	
16. Sevier River Basin	UT	Island of Oahu	
17. Tombigbee River Basin	MS, AL	57. Wind-Bighorn, Clarks Fork River Basin	WY, MT
18. Southeast River Basin*	GA, AL, FL, NC, SC	58. Big South Fork of the Cumberland River	TN
19. Texas Study Commission*	TX	59. Blackwater-Lamine River Basin	MO
20. Colorado Rivers (6 Subbasins)	CO, UT, WY	61. Texas Coastal Basin	TX
Colorado River Basin		64. Ashley-Combahee-Edisto River Basin	SC
Gunnison River Basin		65. St. Francis River Basin	AK, MO
White River Basin		67. Kankakee-Elkhart River Basins	IN
Yampa River Basin		69. Iowa-Cedar Rivers Basin	IA, MN
San Juan River Basin		71. Monongahela River Basin	WV, MD, PA
Dolores River Basin		72. Santa Cruz-San Pedro River Basin	AZ
21. James River Basin	SD	73. San Gabriel River Basin-Joint Study PL 87-639	CA
22. Meramec River Basin	MO	Westwide Water Study	CO, AZ, CA, ID, MT, NV,
23. Poteau River Basin	OK, AK		WA, WY
24. Florida Rivers (3 Subbasins)	FL, AL, GA	75. Chicago Metropolitan Area Rivers	IL
St. Johns River Basin & Intervening Coastal Areas		85. Red River Above Denison Dam	TX
Kissimmee-Everglades Area		89. Kalamazoo River Basin	MI, IN
25. Big Blue River Basin	NE	102. Arkansas River Drainage Within Oklahoma	OK
26. Elkhorn River Basin	NE		

(Type 4)

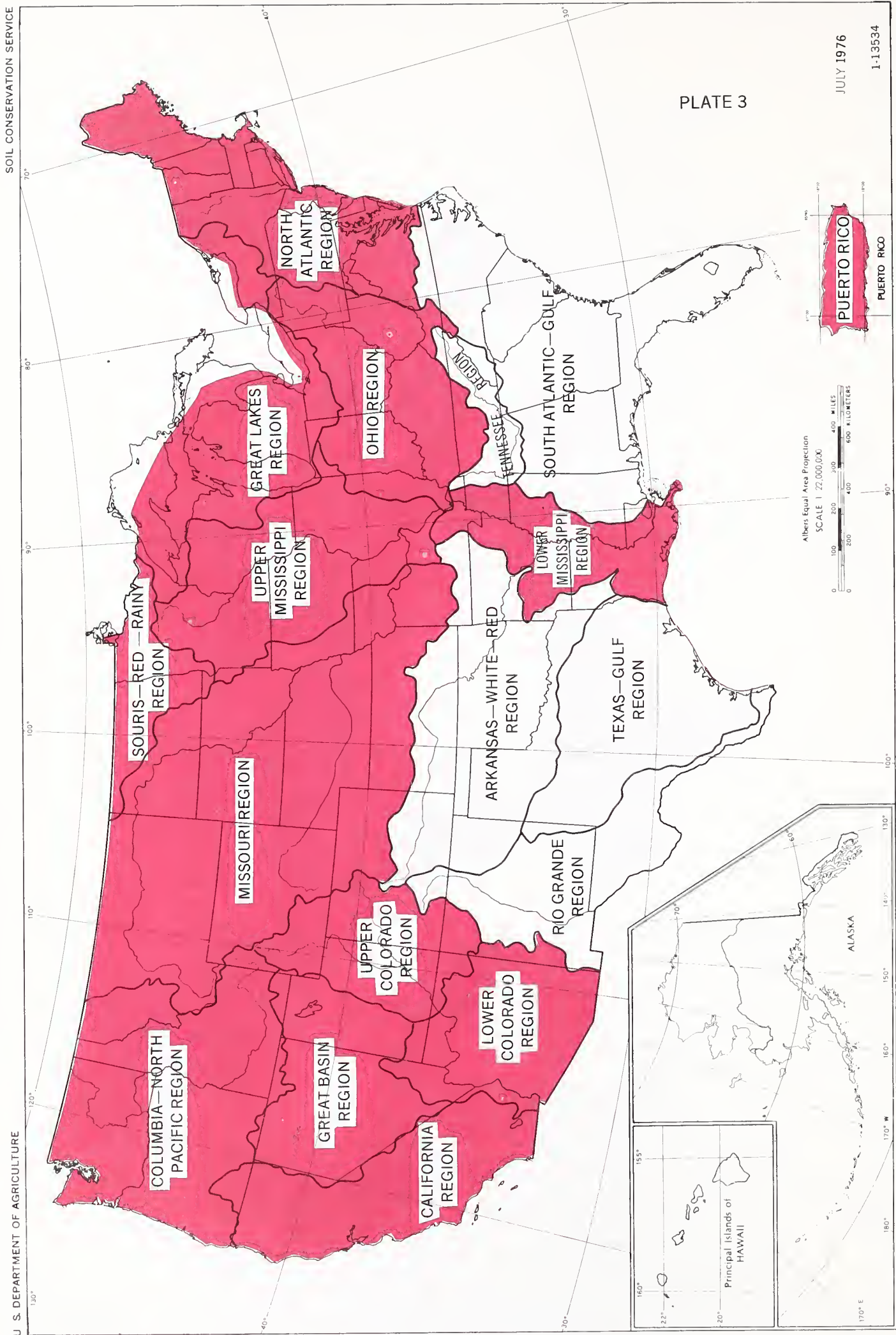
In Progress - February 1978



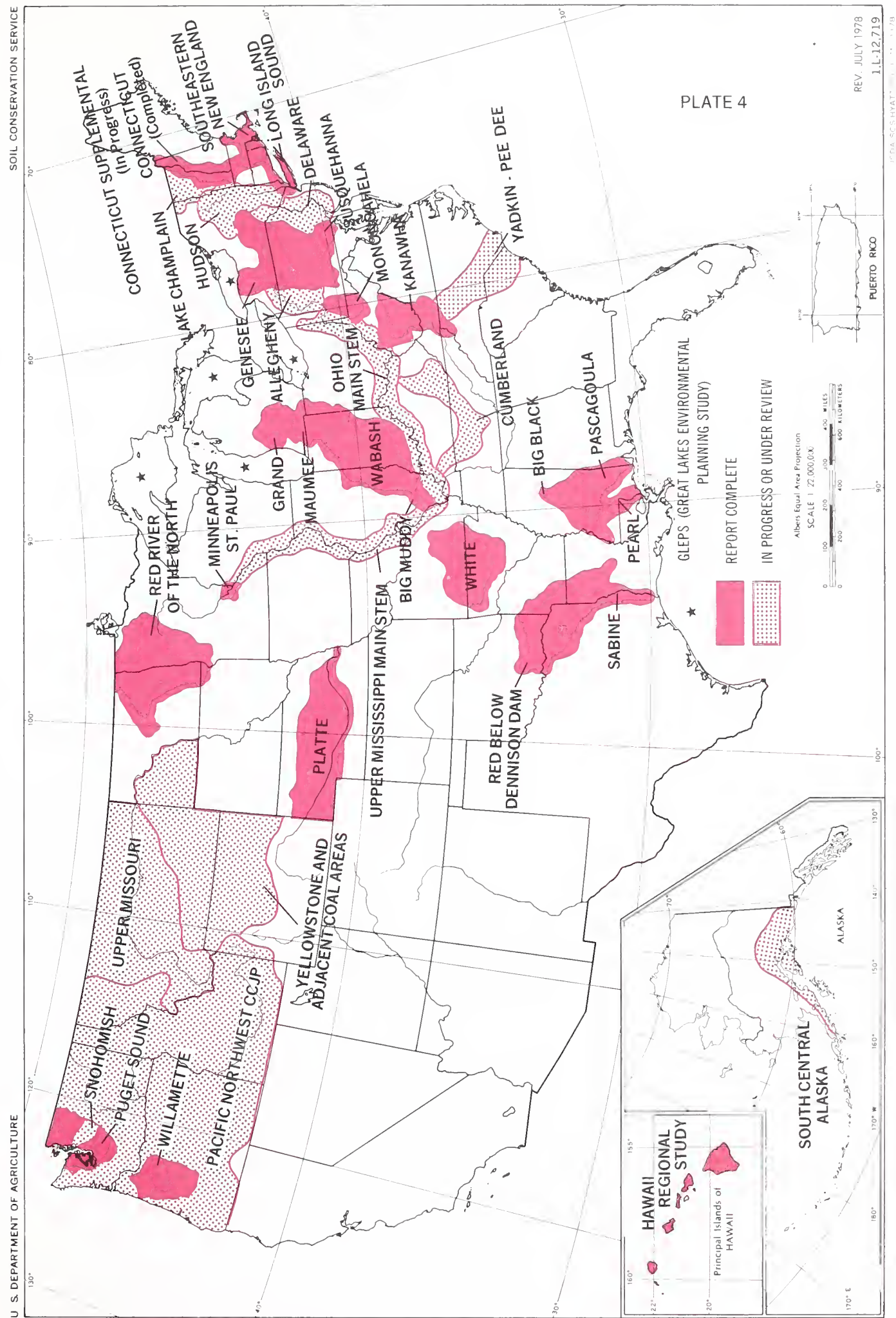
COOPERATIVE RIVER BASIN SURVEYS
In Progress as of July 1978

<u>STUDY NAME</u>	<u>STATES COVERED</u>
11. Oregon Rivers (3 Subbasins) Tillamook Bay Goose and Summer Lakes Basin Siletz River Basin	OR
20. Colorado Rivers (1 Subbasin) Rio Grande River Basin	CO, AZ, NM, UT
24. Florida Rivers (1 Subbasin) Northeast Gulf River Basins	FL, AL, GA
52. Yazoo-Mississippi River Basin Restudy	MS
53. Loup & Republican Rivers	NE
54. Green & Kentucky River Basin	KY, TN
55. Massachusetts Water Resources Study	MA
60. Southwest Ohio River Basins	OH
62. Alabama River Basin	AL
63. Black Warrior River Basin	AL
66. Southern Minnesota Rivers Basin	MN, IA, SD
68. Eastern New York River Basins	NY
70. Obion-Forked Deer River Basins	TN
76. Bear River Basin	UT, ID, WY
77. Snake River Basin	ID, WY
78. Tar-Neuse River Basins	NC
79. Western South Dakota River Basins	SD
80. Clark Fork of the Columbia River Basin	MT
81. San Joaquin Valley Basin	CA
82. Arkansas-White-Red River Basin	NM
83. Pocatolico River Basin-Joint Study PL 87-639	WV
84. Ouachita River Basin	LA, AR
86. Chowan River Basin	VA, NC
87. Eastern Washington River Basins (3 Subbasins) Entiat River Basin Palouse River Basin Yakima River Basin	WA
88. North Platte River Basin	WY
90. Chickasaw Basin-Joint Study PL 87-639 Wolf and Loosahatchie River and Nonconnah Creek	TN, MS
91. Pennsylvania Analytical Summary	PA
92. Wisconsin River Basin	WI
93. Delmarva Peninsula Basin	MD, DE, VA
94. Mississippi Statewide Study	MS
95. Northern Missouri River Tributaries Basin	MO
96. Little Colorado River Basin	AZ, NM
97. Southern Iowa Rivers Basin	IA
98. Green River Basin	WY, MT
99. Potomac River Basin	WV
100. Virgin River Basin	NV, AZ
101. Colorado River Salinity Study	CO
103. Arkansas Statewide Study	AR
104. Sacramento Valley Basin	CA
105. New River Study-Joint Study PL 93-251	TN
106. Upper Mississippi River Basin, GREAT Studies	IA
107. Central Ohio River Basins	OH
108. Yadkin-Pee Dee River Basin	SC, NC
109. Alaska Rivers	AK
110. Arkansas River Basin	CO
111. Tennessee River Basin-Alabama Portion	AL
112. Upper Allegheny River Basin PL 87-639	NY, PA
113. Maine Agriculture Water Non-Point Pollution Study	ME
114. Texas Statewide Sedimentation	TX
115. Mount Agamenticus River Basin	ME
116. Des Moines River Basin	IA
117. Nebraska River Basins Special Study for Nebrasks State Water Plan	NE
118. Minnesota River Subbasins PL 87-639	MN
119. Patapsco River Basin	MD
120. New Jersey Statewide Sediment, Erosion, and Agricultural Waste Study	NJ
121. Hamakua Area Agricultural Water Supply Study	HI
122. Lancaster Area Water, Land and Related Resources Study	PA

RIVER BASIN SURVEYS
FRAMEWORK STUDIES
Completed Type 1 (Level A) Coordinated Comprehensive Framework Surveys - June 1976



RIVER BASIN SURVEYS RIVER BASIN AND REGIONAL PLANS Type 2 (Level B) Coordinated Comprehensive Detailed Surveys - February 1978



CHAPTER 6

FEDERAL INTERAGENCY RIVER BASIN STUDIES

The concept of interagency river basin studies probably originated with the Flood Control Act of 1936. USDA was authorized to make studies of all the river basins covered by the Corps of Engineers "308" reports in order to achieve a better balance of planned works of improvement. A specific effort at interagency planning was made by combining the separate reports of the Corps and the Bureau of Reclamation on the Missouri River basin into one plan, the Pick-Sloan Plan. It was authorized for construction by the Flood Control Act of 1944. An attempt was made to give this plan even more of an interagency character by the Young Plan which covered USDA interests and activities. It was printed in 1949 but never authorized for implementation. (See Chapter 2) However, these efforts involved only the overlapping of separate agency plans. They did not represent a real attempt at developing an interagency plan.

Arkansas-White-Red River Basin Plan

The Arkansas-White-Red River Basins plan was the first real attempt by an interagency group to prepare a coordinated, long-range comprehensive plan for the development of the water resources of a river basin. Existing agency organizations were not compatible with such a joint effort. Agency personnel were oriented to their respective programs and were not readily receptive to overlapping phases of other agency programs. Jealousies of area and program responsibilities, as well as procedures, were strongly in evidence. (218)

In spite of all the problems encountered, the Arkansas-White-Red River Basin Interagency Committee (AWRBIAC) was able to put together a physical plan which embodied the major features of a coordinated comprehensive river basin plan. While the plan was not all that was desired, it was probably better than any which previously had been achieved by other basin planning efforts. (219)

Senator Robert S. Kerr of Oklahoma spawned the idea of the Arkansas-White-Red River Basin Study. Legislatively, it originated in a bill which he introduced in the Senate in 1949 during the first session of the 81st Congress. His bill was S-1576 and the companion bill in the House was HR-4331. (220)

The stated purpose of his bill was to establish a U. S. Commission on the AWR River Basins. He contended in hearings that the time was past for Federal natural resource departments to work separately on river basin problems. His convictions evidently were founded on the overlapping, duplication and feuding which reigned in the Missouri River Basin until the separate plans of the Corps of Engineers and Bureau of Reclamation were combined into the Pick-Sloan Plan. He proposed that a commission of

five Federal members and eight State members be formed to coordinate, control and direct the development of a comprehensive plan for the AWR area. Neither of these Bills was enacted. (221)

The provisions of the Kerr bill in modified form were included in a Senate amendment to HR-5472 which became the Flood Control Act of 1950. The modifications dropped Louisiana as a participant of the study, eliminated its area from the study area, and provided that the Federal members would constitute the full commission. This amendment was not enacted. Instead, Section 205 was included which required the Secretary of the Army to cause a comprehensive plan to be made of the AWR area under the direction of the Chief of Engineers. The plan was to be coordinated with the Departments of Agriculture and the Interior and the Federal Power Commission, other appropriate Federal agencies, and the various States. It contained a further provision that all Federal projects which had been constructed, were under construction, were authorized for construction, or that thereafter might be authorized for construction in accordance with reports completed or being completed under the provisions of the Flood Control Act of 1944, would "not be altered, changed, restricted, delayed, retarded, or otherwise impeded or interfered with by reason of this paragraph". (222)

It appeared that the Chief of Engineers could proceed to develop a single-agency plan of a comprehensive nature which could be coordinated with the various Federal agencies which had program interests in the AWR area. President Truman, however, had a different idea. After signing HR-5472 into law, he sent letters to the Departments of Army, Agriculture, the Interior, and Commerce, the Federal Security Agency and the Federal Power Commission directing that the AWR River Basin study be conducted on an interagency basis. He felt that it was important for the efforts of the various agencies to be integrated from the very beginning of the investigation. He designated the Department of the Army as the chair agency. (223)

In accordance with the President's letter, the Federal Inter-agency River Basin Committee (FIARBC) passed a resolution establishing the Arkansas-White-Red River Basins Interagency Committee (AWRBIAC) on June 12, 1950. This committee completed the necessary investigations and adopted a proposed plan for the Development of Water and Land Resources of the Arkansas-White-Red River Basins in June 1955. The plan was transmitted to the President in May 1956 and to the Congress in June 1956. (224) It was published as Senate Document No. 13, 85th Cong., 1st Sess., January 17, 1957.

The AWRBIAC consisted of a representative from each of the Departments of Army, Agriculture, the Interior, Commerce, and Labor, the Federal Power Commission, and the Federal Security Administration (Public Health Service) and one from each of the eight states. The Corps of Engineers provided the permanent chairman. Each member was responsible directly to his own agency. The committee could take action only on those matters on which there was unanimous agreement. Disagreements were

referred to the FIARBC for settlement. (225)

The AWRBIAC considered itself discharged as of June 30, 1955, after authorizing the chairman to transmit the report to the Chief of Engineers. A new charter, effective July 1, 1955, was issued by FIARBC which established a new AWRBIAC. The new committee has the same composition as the old, except that the chairman is elected annually from and by the Federal members. AWRBIAC has no action program of its own. Appropriate works of improvement continue to be installed by individual agencies, Federal and state, under their regular program authorities. The AWR Report serves as a framework plan, as a convenient reference document to each action agency, and provides some information concerning desirable coordination that needs to be effected. (226)

USDA was, and continues to be, a full time participant in all AWRBIAC activities. This ensured that agricultural interests received proper consideration in the development of the comprehensive plan. However, the constraints imposed by Sec. 205, Flood Control Act of 1950, prevented full consideration of upstream alternatives to other potential projects which were under study at the time the comprehensive plan was initiated.

Five years of interagency conflict on projects and policies prevented the committee from achieving what it had originally intended, a comprehensive plan in sufficient detail to serve as a basis for authorizing projects. (227)

Ad Hoc Water Resources Council

Both the Administration and the Congress were developing an attitude that water resource planning should be done cooperatively by representatives of the Federal, state and local governments. It was out of this background that Senate Resolution 48 of the 86th Congress was introduced on April 20, 1959. Pursuant to that resolution a Senate Select Committee on Water Resources was established. Senator Robert Kerr of Oklahoma was elected chairman. The committee made its report to the Senate on January 30, 1961. (228)(229)

The first recommendation of this committee called for the Federal government, in cooperation with states, to prepare plans for the comprehensive development and management of the water resources of all major river basins. (230)* When President Kennedy took office on January 20, 1961, he sought new means to coordinate Federal resource programs. Three weeks after the Senate Select Committee's report was filed, he sent to Congress a message on natural resources in which he adopted and expanded the recommendations of the Senate Select Committee. On July 13, 1961,

* A more detailed discussion of the Senate Select Committee is given in Chapter 9.

he forwarded his recommendations for legislation to implement the report of the Committee. The Administration bill was introduced in the Senate by Senator Anderson and 15 cosponsors on July 14, 1961, as S-2246 of the 87th Congress. (231)

Shortly after submitting the planning bill to Congress, the President requested the four Secretaries who would comprise the proposed Water Resources Council to review current policies, standards and procedures for formulation, review, and evaluation of water projects and develop new ones for uniform adoption by all Federal agencies. (232) The Secretaries concerned were: Secretary of Agriculture, Secretary of the Army, Secretary of Health, Education and Welfare, and Secretary of the Interior. The President, therefore, began to use these four Secretaries as an ad hoc Water Resources Council.

To coordinate the comprehensive planning effort initiated by President Kennedy the four Departments set up an Interdepartmental Staff Committee. This Committee was chaired by Henry Caulfield of Interior. Hollis R. Williams, Deputy Administrator for Watersheds, SCS, represented the Secretary of Agriculture. In the spring of 1963 this Committee reviewed the comprehensive river basin planning program and prepared a joint statement of principles and concepts defining the scope of the coordinated planning program which was consistent with the policies and standards approved by President Kennedy on May 15, 1962. (233) This statement, "Comprehensive River Basin Planning" (234), was used as a common basis for instructions issued by each of the Departments calling, for the first time, for initial interdepartmental coordination of budget preparation in the field and for explicit indication of proposed transfers of funds between agencies of the Departments. In addition this joint statement outlined, in general, the participation of the various Departments. (235)

The aims of the comprehensive river basin planning program of the ad hoc WRC were: (1) to achieve President Kennedy's objective of covering the entire Nation with regional framework studies by 1970; and (2) to accelerate formulation of detailed plans for some sub-basins of these regions in order to develop a backlog of plans which could be converted to construction programs as circumstances might require. (236)

The information contained in the two documents discussed above, together with guidelines from the Interdepartmental Staff Committee, provided the background and basis for SCS River Basin Memorandum 10, dated June 8, 1965, (now cancelled). The Memorandum provided instructions to USDA agencies which participated in the Type I and Type II Comprehensive River Basin Surveys.

Type I Surveys

The primary objective of USDA participation in river basin surveys is to facilitate the coordination and orderly conservation, development, utilization and management of water and related land resources.

Programs formulated by USDA for these purposes will promote economic growth and development, ensure the preservation of water and related land resources for future generations, and permit proper and efficient utilization of available resources. Components of these programs contribute to the satisfaction of current and long-term needs for resource utilization. USDA uses information developed in river basin surveys to coordinate its project-type water and related land resource conservation and development programs with those of other Federal, state and local agencies. (237)

A Type I survey is a general appraisal of the overall water and related land resource problems and development potentials of a major region. This type survey is intended to produce a framework into which projects and programs for resource development can be fitted in proper relation to each other. Such a survey is made only in sufficient detail to prepare a report describing the current and long-term problems and development potentials of each sub-basin. The report is a coordinating device. It will serve as a broad guide for subsequent, more detailed, planning of individual sub-basins and/or specific projects. Such a report will indicate which sub-basins have problems of sufficient complexity to require more detailed planning efforts and which ones do not. A Type I survey report is not an authorizing document. Hence, locations, physical dimensions, costs, benefits or other individual project data are not needed nor presented in these reports. (238)

The five major elements of a Type I survey are:

1. Studies and projections of economic development in the region;
2. Translations of such projections into needs for water and related land resource uses;
3. Appraisals of the availability of water supplies both as to quantity and quality;
4. Appraisals of the availability of land resources; and
5. A description of the characteristics of present and future problems and the general approaches that appear appropriate for their solutions. (239)

In its letter of December 12, 1963, to Kermit Gordon, the ad hoc Water Resources Council estimated that framework studies (Type I) of 18 regions encompassing the Nation (except Alaska) could be substantially completed by 1970 at a cost of about \$51 million. These studies would furnish a general appraisal of overall water and related resource development needs and a guide to further detailed planning within the regions. (240) Only one Type I study, the Ohio River Basin, had been initiated by the end of 1963.

The ad hoc WRC proposed that the coordinating committee device of the Corps of Engineers be considered as a feasible means to provide guidance for the conduct of the studies. It would provide for complete participation and continuous coordination of the activities of the concerned planning agencies in the planning effort. It would be used in

all regions except the Columbia-North Pacific and the Missouri Basin where the respective interagency committees, CBIAC and MBIAC, would coordinate or furnish guidance for the planning activities among all Federal agencies concerned and the States. It was expected that these coordination activities would be assumed later by river basin commissions after passage of proposed legislation. (241)

The concept of the framework studies was excellent. If they had been carried out as visualized by the Interdepartmental Staff Committee of the ad hoc WRC, they would have provided the framework and guidance desired.

The first Type I study was on the Ohio River Basin. There already had been so much detailed study in this basin, that it seemed impossible for the agencies to settle for the generalized approach desired. For example, the SCS proposed only to make sufficient studies to determine those sub-basins in which upstream projects could make significant contributions toward the solution of the sub-basin water and related land resource problems. Once this was done, it (SCS) expected that the more detailed Type II plans would establish the inter-program relationships with other agency programs. If other agency project-type programs were not found to be feasible in a sub-basin, then SCS would proceed with its program without the need for further coordination.

The Corps had so many projects installed, underway, proposed, or identified for planning that it requested that SCS identify all potentially feasible upstream watershed projects. This greatly intensified the detail of study required. This intensified detail was, of course, carried into other agency studies. It resulted in the accumulation of such a massive amount of data that it was impossible to give it adequate consideration in plan formulation for a major river basin.

The Ohio study procedure was adopted by other Type I study management groups. In the Missouri River Basin, a much larger region area-wise, the volume of data accumulated was staggering. These increased study intensities resulted in greatly increased expenditures. Soon the Office of Management and Budget was taking exception to program costs and curtailing new starts. As a result, framework plans were developed on only 13 of the 18 regions proposed. Two of these were designated as Level A studies which were of a reduced level of intensity from the Type I. USDA participated in a very nominal way in the Puerto Rico study which was not comprehensive in the sense of other studies.

Of the remaining five regions only two, the Rio Grande and Tennessee Regions, are not covered or partly covered by an interagency study. The Arkansas-White-Red Region is covered by the AWRBIAC study previously discussed in this chapter. The Texas-Gulf Region was covered essentially by the Texas Study Commission study and almost half of the South-Atlantic Gulf Region was covered by the Southeast River Basin Study Commission. The Hawaii Region, while not included in the original 18 regions, is being covered by a Level B study.

The Type I and Level A studies and the dates of USDA participation are as follows: (242)

<u>Study</u>	<u>Initiated</u>	<u>Completed</u>
Ohio River Basin	1963	1970
Missouri River Basin	1964	1969
Upper Mississippi R. B.	1964	1971
Columbia North Pacific	1966	1972
North Atlantic Region	1966	1972
California Region	1967	1972
Lower Colorado Region	1967	1971
Upper Colorado Region	1967	1971
Great Lakes Region	1968	1976
Souris-Red-Rainy Region	1968	1973
Great Basin Region	1969	1972
Lower Mississippi Region	1971	1975

Plate 3 shows the location and identity of each of the Regions and the status of the studies.

It is not contemplated that additional Type I or Level A studies will be made. However, if needed, they will be undertaken on a reduced scale. The National Assessment is intended to give a general appraisal of overall National needs for water-related goods and services based on correlated projections of population and economic activity in each region of the Nation. The process may be a continuing study reported every five years and would serve as a national guideline to regional framework studies which should be kept viable by updating. The framework studies or their equivalent will be updated or revised as necessary by River Basin Commissions or WRC Coordinating Committees where required, to contribute to the National Assessment. (243)

Type II and Level B Surveys

The detailed sub-basin plans or Type II studies proposed by the ad hoc WRC would provide a basis for authorization of specific projects or groups of projects. Due to budget constraints imposed by the Administration, the ad hoc WRC recommended that the detailed studies be limited to the completion of the plans for the 16 sub-basins underway in December 1963. These 16 sub-basins had been designated for Type II studies by the Interdepartmental Staff Committee of the ad hoc Water Resources Council in 1962. They were selected from a list of sub-basins which previously had been designated for Corps of Engineers planning studies by resolutions of the House and/or Senate Committees on Public Works. The ad hoc WRC estimated that these 16 studies could be completed by 1970 at a cost of approximately \$37 million. (244)

The detailed studies offered some excellent opportunities to correlate the planning procedures of the various agencies. For example, when both upstream and downstream reservoirs were included in the same system in a sub-basin, it was necessary for the hydraulic criteria and

hydrologic analyses used by the concerned agencies to be compatible. Water detained in upstream reservoirs would eventually pass through major downstream structures in the same system. Therefore, comparative release rates and times of concentration had to be considered in planning both types of structures. Likewise, it was imperative that economic evaluation criteria be coordinated. Agreement had to be reached on distribution of flood damage reduction benefits between upstream and downstream structural measures which affected the same evaluation reaches. This joint planning effort brought about a better understanding and acceptance of agency programs than had previously existed. It also made possible a proper ordering of priorities among structures and programs. However, political implications are such that this possible benefit has not been fully realized.

Of the original Type II studies, USDA funded its participation in 15. They were: (245)

Pearl River Basin	Big Black River Basin
Susquehanna River Basin	Pascagoula River Basin
Willamette River Basin	Puget Sound Basin and Adjacent Waters
Wabash River Basin	Big Muddy River Basin
Kanawha River Basin	Sabine River and Tributaries
Red River below Denison Dam	White River Basin
Genesee River Basin	Connecticut River Basin
Grand River Basin	

These basins had been authorized for Corps of Engineer study before this program was initiated. Other agencies were authorized to participate by the ad hoc WRC. Study coordination was effected through the coordinating committee device of the Corps of Engineers.

Plate 4 shows the location of these studies as well as that of the Level B studies which have been initiated since 1971.

A Regional or River Basin Plan (Level B) is a preliminary or reconnaissance level water and related land resource plan for a selected area. It is prepared to resolve complex long-range problems identified by framework studies and the National Assessment and, therefore, will vary widely in scope and detail; will focus on middle-term (15 to 25 years) needs and desires; will involve Federal, state and local interests in plan development; and will identify and recommend action plans and programs to be pursued by individual Federal, state and local entities. (246) USDA is participating in 33 such studies and 24 have been completed. (247)

The 1976 field survey of the use of River Basin Plans identified over 1,050 individual uses of data from framework plans. It also showed that these data had affected decisions for actions in over 280 instances. Uses of data from Type II or Level B plans were identified in over 400 instances and action decisions were affected in over 180 instances.

CHAPTER 7

OTHER ACTIVITIES RELATED TO THE WATERSHED PROTECTION AND FLOOD PREVENTION PROGRAMS

Flood Hazard Analyses

The basic responsibility for flood hazard information studies, at the Federal level, is assigned to the Corps of Engineers. An inter-agency Task Force on Flood Control Policy prepared a report entitled "A Unified National Program for Managing Flood Losses", published in August 1966 as House Document 465, 89th Congress. Recommendation 9(c), "Regulation of Land Use", recommends that USDA prepare preliminary flood hazard reports "for guidance in areas where assistance is needed before a full flood hazard information report can be prepared or where a full report is not scheduled". Executive Order 11296 (August 10, 1966) placed constraints on the use of Federal funds for construction and on the disposal of Federal lands where flood hazards exist. USDA Secretary's Memorandum 1606, dated November 7, 1966, assigned to SCS the responsibility to represent the Department under E.O. 11296. Executive Order 11988 (May 1977) also directs Federal agencies to determine flood hazards and to avoid developing or modifying the flood plain wherever possible.

The legislative authority for SCS to participate in and to fund flood hazard studies is provided by Section 6, P.L. 83-566. These studies are carried out as cooperative efforts with state and local governments. A description of this program is covered in Subpart C of Part 621, 40 FR, 12474, March 19, 1975. (248)

This program was initiated in Fiscal Year 1968 under the direction of the Director, River Basins Division, SCS. The first state to participate in this cooperative program was Oregon. The program moved rather slowly the first few years because of lack of information and understanding by prospective cooperating agencies, and lack of both manpower and financial resources available to SCS. However, during the past several years requests for SCS flood hazard studies and technical assistance have accelerated rapidly. The volume of such requests has been sufficient to overtax the capabilities of all involved Federal agencies in most states. (249)

There are four specific phases involved in a Flood Hazard Analyses; namely: (1) establishing eligibility, (2) initiating the study, (3) carrying out investigations and preparing the report, and (4) assisting the local government use of the study findings. (250)

Local governments are eligible for assistance in those states where cooperative flood hazard analyses have been authorized by the SCS Administrator. He authorizes the State Conservationist to initiate the

Flood Hazard Analyses Program (now called the Flood Plain Management Assistance Program) only after the responsible State Agency or the Governor requests this assistance and the State Conservationist indicates he has the manpower and capability to carry out such studies. A Joint Coordination Agreement (JCA) then is entered into by the State Conservationist and the State agency responsible for flood plain management activities. It sets forth the objectives, coordination, scope, report requirements, agency responsibilities, and general funding arrangements for the program in that State. (251)

A Plan of Study (POS) is then prepared for each specific study. (252) It is the joint responsibility of the requesting local government(s), the responsible State agency, and the SCS State Conservationist. It sets forth the responsibilities of each involved entity in carrying out the study and in interpreting and using the data in a local flood plain management program.

Flood hazard studies are carried out as detailed engineering analyses. They are performed so that the basic flood-elevation data developed will also meet the HUD Flood Insurance Study Guidelines and Specifications. (However, the first Oregon study used geomorphological procedures to outline the flood plain.) To ensure that the technical data presented in these reports are understood and used by the responsible local government(s), the State Conservationist provides continuing technical assistance to help achieve an effective local flood plain management program. (253)

SCS does not require any specific amount of cost sharing by the State or the local requesting government(s). Local governments often provide field survey assistance, maps, temporary office space, publicity, secure landowners permission for survey access, hold public meetings, share reproduction costs, and distribute the final report. Cost-sharing to date has ranged from 0 percent to 60 percent. For the 77 ongoing studies as of September 30, 1977, the average cost-sharing was 25 percent. (254)

The status of this program as of September 30, 1977, was as follows:

- 200 studies had been initiated covering 360 communities or local jurisdictions;
- 123 study reports had been published in 28 states;
- 77 studies were currently underway;
- 36 states were participating in the program.

Fiscal Year 1976 was the most productive year to date for this program. During that year SCS obligated \$1,885,000; initiated the program in four new states; started 34 additional new studies; and published 45 study reports covering 62 separate communities.

The program level from Fiscal Year 1970 through 1977 is indicated in the following table:

SCS Flood Plain Management
Assistance Program
(as of September 30, 1977)

Fiscal Year	Obligations (Dollars)
1968	\$ 3,600
1969	27,300
1970	59,000
1971	154,000
1972	357,000
1973	740,000
1974	1,015,000
1975	1,744,000
1976	1,885,000
T.Q.	493,000
1977	<u>1,902,000</u>
Total	\$8,379,900

Flood hazard study reports contain descriptive and historical data pertaining to floods and flood frequencies, maps of flood plain reaches showing flood frequency lines, and water surface profiles showing relative elevations of the flood-frequency lines at specific valley cross sections. The data are presented in such a way as to be readily interpreted and effectively used.

Flood Insurance Studies

The Housing and Urban Development Act of 1968 (P.L. 90-448, approved August 1, 1968), the Housing and Urban Development Act of 1969 (P.L. 91-152, approved December 24, 1969), and the Flood Disaster Protection Act of 1973 (P.L. 93-234, approved December 31, 1973) provide the legislative authorities for the National Flood Insurance Program. The Secretary of Housing and Urban Development (HUD) is charged with the responsibility for this program. These authorities have been further delegated to the Federal Insurance Administration, a HUD agency. (255)

Section 204, Flood Disaster Protection Act of 1973, amended Section 1360, National Flood Insurance Act of 1968. This amendment authorized the Secretary of HUD "to consult with, receive information from, and enter into agreements or other arrangements with the Secretaries of the Army, the Interior, Agriculture and Commerce, the Tennessee Valley Authority, and the heads of other Federal departments or agencies, on a reimbursement basis" in order to identify and publish information with respect to flood-prone areas. (256)

The amended Act further states that the Secretary of Agriculture, through the Soil Conservation Service, as well as other agencies engaged in the identification or delineation of flood-risk zones within the several States, shall, in consultation with the Secretary of HUD, "give the highest practicable priority in the allocation of available

manpower and other available resources to the identification and mapping of flood hazard areas and flood-risk zones," in order to assist the Secretary to meet the established deadline (August 1, 1983). (257)

This recommended priority has caused some differences between SCS and FIA. In April 1973, the FIA requested SCS to take on two major nationwide special studies on a crash basis. No other Federal agency or private contractors would undertake these two efforts. SCS was the only agency that had a technical delivery system which was adequate to meet the demands of these studies. (258)

The first study involved compiling a list of all flood-prone communities in the nation, on a county-by-county basis. It was initiated in June of 1973 and completed in September of the same year. Information on over 13,500 flood-prone communities was collected and furnished to FIA by SCS. This effort involved every SCS field office and required that time be taken from other ongoing USDA programs. (259)

The second major national crash effort for HUD was to obtain copies of community maps for the 13,500 flood-prone communities. This time-consuming job was essentially completed in October 1973. (260)

Since starting in 1969, HUD has initiated some 22 types of flood insurance studies. Individual studies are initiated after SCS furnishes a time and cost estimate to the FIA and receives a project order. At the beginning of each fiscal year SCS enters into an Inter-agency Agreement (IAA) with HUD to perform detailed studies, as mutually agreeable, on a reimbursable basis. The agreement defines the approximate dollar value for studies to be initiated that year. The dollar value amount can be adjusted by a modification of the IAA if necessary. (261)

A project order prescribes the type of study to be performed for each noted community, period of performance, and the total estimated cost of each community study. (262)

SCS is one of six Federal agencies carrying out reimbursable studies for HUD. SCS initiated its first detailed flood insurance study in West Virginia, in June 1969. As of September 30, 1977, SCS had initiated 349 detailed FIS's in 44 states and Puerto Rico. It had completed 191 of these studies and submitted them to FIA and had 158 studies in 30 states underway. (263)

The level of SCS activity and funding in this program is shown in the following table: (264)

Reimbursable HUD Flood Insurance Studies
(as of September 30, 1977)

FISCAL YEAR	PROJECT ORDERS RECEIVED	NUMBER OF STUDIES INITIATED - COMPLETED	
1969	\$ 9,000	1	0
1970	207,500	15	10
1971	952,300	62	36
1972	761,600	41	43
1973	1,000,000	27	25
1974	1,067,000	15	15
1975	1,220,600	35	8
1976	1,500,000	73	14
T.Q.	326,120	16	4
1977	3,232,490	64	36
TOTAL	\$10,276,610	349	191

The Federal Insurance Administration has determined that there are a total of some 21,600 communities which contain flood-prone areas. (265) As of December 31, 1977, there were 15,770 communities participating in the National Flood Insurance program. Flood insurance is available for any walled and roofed building or mobile home and its contents throughout each community. Of these, 14,186 were participating in the Emergency Program. There is a large backlog of communities with flood-prone areas which still need detailed flood hazard studies. (266)

Recreation and Fish and Wildlife

1. Recreation

The demand for outdoor recreation is greater than it has ever been in the history of this Nation. With more leisure time, more spendable income, and greater mobility, people are seeking the outdoors in ever increasing numbers. In the past 15 years interest in outdoor recreation has outstripped population trends. Both Federal and state recreation facilities already are overcrowded in most areas. This provides an opportunity for the development of local water-based recreation facilities. (267)

The Watershed Protection and Flood Prevention Act was amended by P.L. 87-703, 76 Stat. 605, 608, 609, 16 U.S.C. 1002, to provide for recreation cost-sharing in watershed projects. The law provides that the Secretary of Agriculture can bear not to exceed one-half of the costs of land, easements, and rights-of-way for the reservoir and recreation area, minimum basic facilities, and land for access to the development. The number of developments per watershed project is limited as follows: one per project containing less than 75,000 acres; two for a project containing between 75,000 and 150,000 acres; and three for a project of more than 150,000 acres. (268)

In addition to Recreation Developments, Water Resource Improvements (WRI) for recreation can be included in watershed projects. The Secretary can cost-share up to 50 percent of the construction costs allocated to recreation in a WRI. Public access must be provided at no Federal cost. There is no limitation on the number of these improvements in a watershed project except that policy restricts the P.L. 83-566 recreation costs to not more than 30 percent of the total P.L. 83-566 costs for the project.

As of April 1, 1977, 38 of the 434 watershed projects completed included recreation as a purpose, and 209 of the 751 not completed had recreation as a purpose. (269) As of January 1, 1977, there were 216 P.L. 83-566 and Authorized Flood Prevention Watershed projects with recreation developments in 39 states. There were 101 projects which had Water Resource Improvements only. The total number of Water Resource Improvements approved for installation were 210. In all there were 311 projects with Recreation Developments and/or Improvements approved for construction in 46 states. (270) It is estimated that the Public Recreation and Fish and Wildlife Developments alone will provide 17.9 million annual user-days of recreation. (271) The Improvements are estimated to provide another 3 million user-days of recreation. (272)

The 459 public developments and improvements involve only a small part of the total number of detention structures planned. As of June 30, 1976, there were already 12,703 floodwater retarding structures constructed. There is no readily available summary of the number planned and still to be constructed, but it will exceed this number. Most of the structures have or will have sediment pools which provide some recreation opportunities. Also, there are over 2 million stock ponds which provide some recreation. (273) Based on a 1959 survey, Carl Thomas, Head Biologist, SCS estimated that 20 percent of these ponds provide excellent fishing, 65 percent average, and only 15 percent poor fishing. This survey also indicated that these ponds can provide up to 64 fisherman days per acre per year.

Carl Sullivan, Executive Director, Sport Fishing Institute, stated in a speech at the 1974 National Watershed Congress that 40 percent of fishermen choose artificial impoundments and that these impoundments attract 50 percent more anglers than natural lakes.

The SCS sought answers to the questions of how popular recreation developments are and their impact on the local communities. By agreement with SCS, the Department of Recreation and Park Administration, University of Missouri, studied five watershed recreation developments in three states. Attendance figures were checked and 400 groups at these lakes were interviewed in 1970. It was found that an average benefit of \$4.26 per recreation-day resulted from these activities. Of this amount 56 percent were benefits which accrued to local communities in the form of admission fees, equipment sales, and purchases of food, fuel and supplies. The remaining benefits accrued to the region in the form of travel costs to and from the watersheds. (274)

Other recreational activities include assisting land owners and operators establish commercial enterprises and to establish, expand, or add to public recreation developments. A total of 1,577,031 acres of recreation improvement, 545,985 acres of recreation land grading, and 18,341 miles of recreation trails and walkways had been established through all SCS programs as of June 30, 1976. (275)

As of June 30, 1977, over 1,315 recreation measures had been completed in Resource Conservation and Development projects. Only 18 of these were cost-shared by the SCS. There were 83 other measures being planned or installed.

The major problems involved with recreation developments are lack of adequate management capability and financial resources to the local sponsors, and promotional ability.

2. Fish and Wildlife

The March 10, 1934 Act, "An Act to promote the conservation of wildlife, fish and game and for other purposes" (16 U.S.C. Secs. 661-664, inclusive) was amended by P.L. 85-624, 85th Congress, August 12, 1958. It is known as the Fish and Wildlife Coordination Act. Its purpose is to recognize the contribution of wildlife resources to the Nation and "to provide that wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation and rehabilitation..." (276)

The Secretary of the Interior, through the U. S. Fish and Wildlife Service, is responsible for carrying out the provisions of the Act. The basic provisions of the Act are applicable to Federal programs and to public and private agencies operating under Federal permit or license. The Act recognized that there is a difference between Federal projects and Federally assisted projects in the application of the provisions of this Act. It amended P.L. 83-566 by adding Sec. 12 to that Act.

Section 12, P.L. 83-566, directs that the Secretary of Agriculture shall notify the Secretary of the Interior when he approves the furnishing of assistance to a local organization in preparing a watershed protection and flood prevention work plan. The Secretary of the Interior then, as he desires, can "make surveys and investigations and prepare a report with recommendations concerning the conservation and development of wildlife resources and participate, under arrangements satisfactory to the Secretary of Agriculture, in the preparation of a plan of works of improvement that is acceptable to the local organization and the Secretary of Agriculture." (277)

The Act further provides that the Secretary of Agriculture shall give full consideration to the recommendations of the Secretary of the Interior. "The plan shall include such of the technically and economically feasible works of improvement for wildlife purposes recommended by the Secretary of the Interior as are acceptable to, and agreed to, by local

organizations and the Secretary of Agriculture,...." (278) It also provides that the costs of making the surveys and investigations and preparing the reports which are incurred by the Fish and Wildlife Service shall be borne by the Secretary of the Interior out of funds appropriated to his Department. (279)

The provisions of Sec. 12 are quite workable and should have resulted in a beneficial cooperative effort in the field. This has not been true in many instances. While good cooperation does occur in some states, in others the reverse is true. In some instances SCS personnel have been negligent in notifying F&WL field offices of pending studies. In other instances, the F&WL offices were notified but did not participate in field examinations and other joint meetings. As a result they were not familiar with the objectives of the sponsors and did not get the F&WL inputs into the planning process for consideration in plan formulation. Frequently, the first information on F&WL recommendations comes to the attention of sponsors in the form of comments on the draft plan.

This condition probably developed partially because Sec. 12 provides that F&WL Service has to pay for its inputs out of its own appropriations and its available resources may have permitted it only to react rather than participate. When a Federal agency is planning a Federal water resource development project, the Fish and Wildlife Coordination Act provides that that agency should transfer funds to the Fish and Wildlife Service out of appropriations made available for investigations, engineering or construction. The F&WL Service has expressed concern that SCS will not do the same on the Federally assisted projects.

Another problem which has affected the cooperative effort is that the F&WL recommendations often are not acceptable to the local organizations and the Secretary of Agriculture. This could be expected when F&WL personnel do not participate in the field examinations and project formulation meetings. Their recommendations often are not compatible with project objectives and greatly increase costs to be borne by local sponsors without providing them any additional benefits.

P.L. 85-865, 72 Stat. 1605, 16 U.S.C. 1004 (September 2, 1958), which amended P.L. 83-566, authorized cost-sharing for fish and wildlife purposes. However, it did not include the costs of land rights except in the case of public fish and wildlife developments. One of the biggest problems comes from the interpretation of mitigation of damages. The F&WL Service interpretation is that mitigation must be in kind. If this cannot be done, it often insists that damaged acreage must be replaced on a multiple basis, such as two or three acres of new land for each one damaged. Such an arrangement greatly increases local costs since land rights must be provided at local expense.

The lack of sound research on the impacts of reservoir and channel construction contributes to the misunderstandings between agency personnel. Numerous channel studies have been made but few, if any, have had base line references. For example, Bayless and Smith made a study of

several coastal streams in North Carolina between 1963 and 1965. They alleged that game fish had been reduced by 90 percent in some of these streams as a result of channelization carried out 40 years earlier. Channels of seven watershed projects included in the study were constructed between 1959 and 1966. Therefore, it would appear that some of the channels sampled either were under construction or construction had just been completed. A recheck of these channels in 1968 did not verify the wide range of yields reported by Bayless and Smith. (280) There was no base line reference for the study except other streams in the area. This study was not well received, even by the people who authorized it. A subsequent study was made which was more acceptable and did show good recovery in several streams. (281) However, here again, no base line reference existed to show actual conditions prior to channelization.

A research study on waterfowl utilization of flood prevention lakes in north-central Texas was made in 1976-1977. (282) The observation period extended from August 1976 to April 1977. The study area included 55 flood prevention lakes selected from 254 lakes in the Chambers Creek, Richland Creek and Grays Creek watersheds in Navarro, Ellis, Hill and Limestone Counties. These 254 lakes have produced nearly 7,000 acres of additional surface waters in this area.

Aerial counts were made on bi-weekly periods during the observation period. Extrapolation of the total duck numbers observed on the 55 study lakes to all 254 flood prevention lakes showed that over 19,000 ducks were present on these lakes at high periods.

An indication of the relative importance of the flood prevention lakes to waterfowl in comparison to other bodies of water in the area was obtained by observing waterfowl on water areas other than flood prevention lakes during the 16 aerial counts. These indicated that the flood prevention lakes were the most important bodies of water in the study area for waterfowl. Many large flocks of ducks frequently were seen on flood prevention lakes not included in the study. In contrast, few large concentrations of waterfowl were ever seen on the four large reservoirs in the area or on the numerous farm ponds.

A study of fish population characteristics of flood prevention lakes also was carried out in 1976-1977. (283) The study area involved 56 flood prevention lakes. Twenty-three species of fish were found in these lakes. Dominant species included largemouth bass, bluegill, redear sunfish, green sunfish, black bullheads, channel catfish, white crappie, and golden shiners.

The study indicated that flood prevention lakes can support important recreation fish populations. In general, limnological conditions were suitable and fish populations were in good condition, with a balance between populations of sport and forage species. Biological factors generally exceeded the physical and limnological factors as direct limiting factors in regulating fish production.

Of particular significance is the fact that most of the streams on which these structures are located either have intermittent flow or flow only when there is flood runoff. Consequently, the streams' value for fishery purposes under natural conditions is either nil or very low.

In spite of the difficulties involved, many fish and wildlife measures have been installed and many benefits have accrued. The edge effects and impounded water behind detention dams are quite beneficial to upland game. Field studies have shown that both wild turkey and deer populations have increased where conservation measures, including water impoundments, have been installed. As of June 30, 1976, as a result of all SCS programs, wildlife wetland management had been installed on 8,304,481 acres; wildlife upland habitat management on 90,739,727 acres; 42,561 wildlife watering facilities constructed; fish pond management applied to 806,641 ponds; 81,660 acres of commercial fish ponds constructed; 470,752 lineal feet of fish raceways constructed; and 3,839,152 lineal feet of fish stream improvements made.

The requirement for environmental impact statements on all projects has brought a more timely consideration of fish and wildlife problems into the planning process. This, together with more timely agency inputs, should greatly improve the quality of fish and wildlife measures in all water resources and other conservation program developments.

Emergency Watershed Protection

Emergency Watershed Protection was authorized by section 7 of the Flood Control Act approved June 28, 1938, as amended by section 15 of the Flood Control Act approved December 22, 1944, which was further amended by section 216 of the Flood Control Act of 1950, P.L. 81-516 (33 U.S.C. 701b-1). (284)

Section 216 reads as follows:

"The Secretary of Agriculture is hereby authorized in his discretion to undertake such emergency measures for run-off retardation and soil erosion prevention as may be needed to safeguard lives and property from floods and the products of erosion on any watershed whenever fire or other natural element of force has caused a sudden impairment of that watershed. Provided, that not to exceed \$300,000 out of any funds heretofore or hereafter appropriated for the prosecution by the Secretary of Agriculture of works of improvement or measures for run-off and water-flow retardation and soil-erosion prevention on watersheds may be expended during any one fiscal year for such emergency measures."

The administration of Emergency Watershed Protection (EWP) has been delegated to the Administrator, SCS. The objective of EWP is to carry out emergency measure installation for soil erosion prevention

and run-off retardation in watersheds that have been suddenly impaired by a natural disaster. These measures are needed to safeguard lives and property from floods and the products of erosion; i.e., to eliminate or reduce hazards created by the event. (285)

Section 216 authority may be used to provide assistance when:

1. The watershed impairment has (a) been sudden; (b) been caused by natural forces, i.e., fire, earthquake, mudslide, etc., (c) resulted in a threat, exceeding the pre-disaster condition, to human life or property from floods or the products of erosion.

2. The emergency measures must be (a) the least costly technique readily determinable that will provide immediate, adequate and safe relief from the hazard, (b) limited to the minimum that will reduce the threat to lives and property to the degree that such threat existed before the sudden impairment, and (c) beneficial to more than one beneficiary.

3. Other criteria are: (a) Section 216 funding is limited to emergency work that is scheduled to be completed within 220 consecutive calendar days after date of allotment of funds, (b) sponsors agree to provide landrights, permits, etc., that may be needed, (c) funding, other than Section 216, for alleviating the hazard(s) has been fully committed, and (d) adverse environmental impacts are to be minimized. (286)

Emergency measures which may be utilized include:

1. Establishing vegetative cover such as grass, shrubs or trees on denuded land,
2. Opening water courses where flow is dangerously restricted; replacing or constructing protective diversions, dikes or jetties,
3. Stabilizing streambanks with vegetative cover, riprap, cribbing or piling,
4. Installing land stabilization measures,
5. Constructing emergency road stabilization measures such as water bars.

Permanent or long-life measures may be installed only if they are the most expeditious way to safely obtain emergency protection. (287)

The SCS has the responsibility for administration of the program on privately owned lands. The Forest Service has the responsibility to administer, under the general program criteria and procedures established by SCS, the forestry aspects of emergency watershed protection on the National Forest System and on rangelands within the national forest boundaries, on adjacent rangelands that are administered under formal agreement, and on other forest lands. (288)

Assistance provided under Section 216 has grown tremendously since its inception. The Federal dollar amount appropriated for watershed emergency assistance has grown from \$100,000 in 1944 to \$65,000,000 in 1976. Supplemental appropriations provided by Congress for this purpose are:

Fiscal Year	Appropriation
1965	\$ 900,000
1969	4,000,000
1970	3,700,000
1973	16,500,000
1973	20,000,000
1974	22,500,000
1976	26,577,000
1976	26,432,000
1976	12,327,000
1977	12,000,000

Total obligations of these funds by SCS and FS by fiscal year are:

Year	Dollars
1960	\$ 210,932
1961	123,369
1962	30,167
1963	68,836
1964	7,362
1965	852,513
1966	31,923
1967	101,045
1968	224,497
1969	299,294
1970	5,281,477
1971	2,908,900
1972	384,565
1973	8,397,399
1974	20,167,737
1975	22,175,469
1976	10,352,559
Total	\$71,618,044

Of the above total obligations, SCS has obligated \$58,160,043 and FS \$13,458,001. (289)

This program has been quite effective in alleviating potential future damages resulting from natural disasters and in restoring watershed conditions. However, it would be much more effective if delays awaiting supplemental appropriations could be reduced. Since the law limits expenditures from existing funds to \$300,000 per fiscal year, a supplemental appropriation must be made each time needed assistance exceeds this amount. This results in delays in assistance and subjects the beneficiaries to extended potential damage. A request has been made to establish a fund for immediate use. Such an action would greatly expedite timely action when emergencies occur.

CHAPTER 8

OTHER WATER RESOURCE ACTIVITIES OF USDA

Agricultural Research Service (ARS) ^{1/}

The ARS was established under Secretary's Memorandum No. 1320, Supplement 4, November 2, 1953. Its assigned responsibility is to conduct all of the production and utilization research of the Department (except forestry research) and the inspection, disease and pest control and eradication work closely associated with this research. This included the research previously carried on by the Agricultural Research Administration. Also, all soil conservation research, except investigations required for the national soil survey, was transferred to ARS from SCS. (290)

The following research activities are of particular importance in the field of water resources:

1. U. S. Regional Salinity Laboratory.

This laboratory was established June 29, 1935 (Ch. 338, 49 Stat. 436). The law authorized the Secretary of Agriculture to conduct research into laws and principles underlying basic problems of agriculture in its broadest aspects and research relating to the conservation, development, and use of land and water resources for agricultural purposes. Representatives of the USDA and Agricultural Experiment Stations of the eleven Western States and Hawaii decided to establish a salinity laboratory to conduct research on problems connected with the sources and permanence of agriculture on saline and alkali soils. In 1951 official cooperation and collaborator representation was extended to include the 17 Western States. The name of the laboratory was changed to United States Salinity Laboratory. The 1958 appropriation act added an additional facility to enlarge the scope of this work. (291)

2. Southwestern Irrigation Field Station.

This station was established at Brawley, California, in June 1948. In fiscal year 1949 Congress made funds available for its development. The facility was dedicated November 3, 1951, to develop more effective methods of soil and water management in the irrigated valleys of the Southwest involving poor drainage and alkali problems. (292)

3. Soil and Water Conservation Research Field Station.

On December 31, 1953, this station at Coshocton, Ohio, was transferred from the SCS to the ARS. In 1960 funds were made available to expand the facility to develop hydrologic information on the effect

of conservation practices on tributary flow on the Muskingum-Wellston-Lanesville and associated soils of the Western foothills of the Appalachians. (293)

4. U. S. Water Conservation Laboratory.

The Appropriations Act of 1958 provided funds to this laboratory to establish a facility at Tempe, Arizona, to increase the efficiency of irrigation practices in the Southwest. (294)

5. USDA Sedimentation Laboratory.

This laboratory was established at Oxford, Mississippi, under the Agricultural Appropriation Act of 1958. Its mission is to conduct basic research on the hydraulics involved in the entrainment, transportation and deposition of sediments as related to the development of the small watershed program. (295)

6. Northwest Hydrology Research Watershed.

The Appropriations Act of 1960 provided funds to establish facilities at Boise, Idaho, to gain basic information on run-off characteristics, including water yields, from plateau and foothill grazing areas of the Northwest. (296)

7. Southern Great Plains Watershed Research Center.

The Appropriations Act of 1961 provided funds for research on hydrology problems in the Southern Great Plains. The Research Center was established at Chickasha, Oklahoma, in the Washita River watershed. (297)

8. North Central Hydrology Research Watershed.

The Appropriation Act of 1962 granted money to establish this watershed at Columbia, Missouri, to develop basic information on precipitation-run-off relationships, sedimentation, and channel stability problems that occur under the intensively developed agricultural areas of the North Central States. (298)

The above named research facilities are only a few of those established throughout the nation, including the Hydraulic Laboratory at St. Anthony Falls, Minnesota, which had research objectives related to water and related land resources. They are, however, representative of water resource research being done and illustrate the involvement of ARS in the USDA activities in this field.

ARS builds and maintains structures that it owns or leases as a part of a research facility or as "equipment" used in specific research studies. They may be used in research on irrigation water, water harvesting, water spreading for groundwater recharge, reservoir sedimentation, or run-off pollution control studies. It also conducts an extensive research program in hydrology and hydraulic structures.

Agricultural Stabilization and Conservation Service (ASCS)

1. The Agricultural Conservation Program (ACP).

The ASCS administers the Agricultural Conservation Program (ACP). From its beginning in 1936, the ACP has been applicable to the present 50 states, Puerto Rico and the Virgin Islands. It has been available continuously as a public financial aid to share costs with farmers and ranchers for carrying out soil, water, woodland and pollution-abatement practices. During the period 1971-1973, the program was known as the Rural Environmental Assistance Program (REAP), and in 1974 as the Rural Environmental Conservation Program (RECP). Each of these programs had basically the same goals and purposes. In 1975 the program name was changed back to ACP. (299)

The Agricultural Appropriation Act of 1950 provided that the county agricultural conservation committee could allot up to five percent of its ACP allotment to the SCS for services of its technicians in formulation and carrying out the ACP. Subsequent appropriation acts have continued this provision. (300) Technical assistance provided by SCS technicians is limited to those practices which are of a permanent nature.

The ASCS Report, Agricultural Conservation Program, Practice Accomplishments by States, 40 Year Summary, 1936 through 1975, lists 91 practices for which it provides or has provided cost-sharing assistance. Of these, only about 36 practices are directly related to water and sediment management. The total Federal cost-sharing on these practices from 1944 through 1973 amounts to about \$1,677 million. (301)

ASCS provides cost-sharing assistance to agricultural producers for soil and water conserving measures. It may cost-share with landowners on the construction of dams designed to: conserve or safely dispose of water; protect against soil erosion or flood damage; or prevent agricultural pollution of water. Since SCS provides technical services for these measures it is involved with all dams cost-shared by ASCS.

2. The Water Bank Program

The Water Bank Program was authorized by the Water Bank Act, P.L. 91-559 (84 Stat. 1468, 16 U.S.C. 1301), approved December 19, 1970. It authorized the Secretary of Agriculture to formulate and carry out a continuous program in important migratory waterfowl nesting and breeding areas, to prevent the serious loss of wetlands, and to preserve, restore and improve inland fresh water and adjacent areas as designated in the Act. (302)

The Congress found it in the public interest to provide for conserving surface waters, to preserve and improve habitat for migratory waterfowl and other wildlife resources, to reduce run-off, soil and wind erosion, and to contribute to water control. (303)

The program provides that eligible persons in selected areas having eligible wetlands in important migratory waterfowl nesting and breeding areas may enter into ten-year agreements, with provision for renewal, and receive annual payments for the conservation of water and to meet other purposes of the Act. The Secretary is constrained from entering into any agreements with owners or operators that will require Water Bank Program payments in any calendar year in excess of \$10,000,000. (304)

The Water Bank Program on specified farm, ranch or other wetlands applies to wetlands identified in a conservation plan developed in cooperation with the Soil and Water Conservation District in which the lands are located, and under terms and conditions set forth by the Secretary. (305)

As of July 1977, the cumulative progress of the program was:

(306)

- Number of states participating	14
- Number of agreements	3,981
- Designated wetland acres	121,897
- Designated adjacent acres	294,087
- Total designated acres	415,984
- Total annual payments	\$4,378,646

Economic Research Service (ERS)^{2/}

The Bureau of Agricultural Economics was the predecessor agency to ERS. In the USDA reorganization of October 13, 1953, work relating to farm management and costs, land economics and agricultural finance were transferred to ARS. The ERS was established on April 3, 1961, by Secretary's Memorandum 1446, Supplement 1. The Natural Resource Economic Division of ERS is concerned with the water resource activities of USDA.

The responsibilities of the Natural Resource Economics Division include study of resource quality, recreation, resource organization, resource law, property rights and ownership, public finance, evaluation and planning techniques, resource inventories, resource conservation, resource development, resource projections, remote sensing, RC&D studies, watershed studies, river basin studies and Water Resource Council activities. (307)

The activities and contributions of ERS in the river basin and watershed planning programs have been discussed in previous chapters. This agency also makes special evaluation studies and water and related land resource studies and prepares reports thereon. Its contributions in the preparation of evaluation procedures for river basin projects have been especially significant. Mark M. Regan, Division of Land Economics, BAE, USDA, was on the staff of the Subcommittee on Benefits and Costs which prepared the Report to FIARBC, "Proposed Practices for Economic Analysis of River Basin Projects", May 1950, known as the First Green Book. This report was revised in May 1958. Mark M. Regan and William

A. Green, Farm Economics Research Division, ARS, USDA, were members of the Subcommittee on Evaluation Standards which prepared this revision.

River Basin Planning is based on long-term projections of economic activities which place demands on water and related land resource use. These projections are developed by a joint effort of ERS and the former Office of Business Economics, Department of Commerce. They are known as OBERS projections and are updated periodically.

ERS also is deeply involved in developing information for use by the Water Resource Council in its National Water Assessment which is prepared on a periodic basis.

Farmers Home Administration (FmHA)

The lineage of FmHA goes back to the Resettlement Administration. This agency was created by Executive Order in 1935 and took over depression-era programs that had been carried on in about 40 states by Rural Rehabilitation Corporations formed under the Emergency Relief Act of 1933. On July 22, 1937, the Bankhead-Jones Farm Tenant Act was enacted. It created a new program of supervised 40-year Farm Ownership loans. Administration of the Act was given to the Resettlement Administration. Also, the Water Facilities Act, to provide loans for individual and association farm water systems in 17 western states, was enacted in 1937. Resettlement shared administration of the Act with SCS and BAE. (308)

As administrative actions were taken to carry out the Farm Tenant Act, the name of the Resettlement Administration was changed to Farm Security Administration and it was placed under USDA. This change took effect in 1938. In 1942, FSA was given full responsibility for the Water Facilities Program. (309)

In August 1946, Congress passed the Farmers Home Administration Act which took effect in 1947. It reconstituted FSA under the new name of Farmers Home Administration. This Act also gave FmHA a new authority: to insure loans made by banks, other agencies and private individuals, as well as to make direct government loans. In 1949 the first of many new additions were made to FmHA services. Due to the scope of this History, further discussion will be limited to those services which deal with water. (310)

The Water Facilities Act was amended in 1954 to apply nationwide rather than be limited to the 17 Western States. It also permitted farm area water systems to take on non-farm customers in rural communities. In 1959, FmHA began to make loans to local organizations covering the local share of cost in P.L. 83-566 Watershed Projects. The Consolidated Farmers Home Administration Act of 1961 provided a major overhauling and expansion of FmHA authorities. Among these, it opened up the water system program to the general rural population, including incorporated towns up to 2,500 and raised the loan limit for a direct FmHA loan from \$250,000 to \$500,000. In 1962 FmHA was authorized to make loans

covering local project costs for Resource Conservation and Development Projects. (311)

The second major expansion of the 1960's in programs serviced through FmHA came under acts passed by Congress in 1965. The Water Facilities loan program was transformed into a loan-and-grant program for both water and waste disposal systems. Rural towns up to 5,500 were made eligible to be included in FmHA-financed projects, and the limit on FmHA financing of a project was raised to \$4 million. In 1968 Congress abolished the statutory annual ceiling of \$450 million in the water-sewer program on FmHA insured loan authority for Farm Ownership and Community Facilities combined. It also raised the national total authorization for water-waste disposal grants from \$50 million to \$100 million a year. (312)

The Rural Development Act of 1972 (P.L. 92-419) August 20, 1972, abolished the \$4 million per project limit on FmHA financing on water and waste disposal systems, increased the national grant authorization for water and waste disposal to \$300 million a year, and raised the population limit on towns included in FmHA-financed systems to 10,000. (313)

The magnitude of FmHA involvement in water related activities is reflected by the following listing of alltime totals of numbers of loans and amounts obligated from the inception of each program through September 30, 1976: (314)

Program	Loans No.	Amount Obligated
Soil and Water Loans (Individuals)	25,399	\$ 159,912,532
Water Facilities Loans (Individuals)	18,296	29,695,363
Irrigation, Drainage, Soil Conservation Loans to Ass'ns.	569	23,300,709
Water and Waste Disposal Loans	14,574	3,372,849,014
Water and Waste Disposal Grants	5,509	646,072,267
Water Facilities Ass'n. Loans	337	7,412,466
Water and Sewer Planning Grants	1,834	22,293,387
Small Watershed Project Loans	398	119,053,324
Flood Prevention Loans	29	3,968,500
Resource Conservation and Development Loans	230	18,735,569

Forest Service

The involvement of the Forest Service in the P.L. 83-566 program, the Flood Prevention Program, and the River Basin Planning Program has been discussed in earlier chapters.

The Forest Service was established as a result of the Transfer Act of February 1, 1905. This Act transferred the forest reserves from

the Department of the Interior to the Department of Agriculture. Secretary of Agriculture James Wilson designated the new agency as the Forest Service. He also charged the Head of the Agency to "see to it that the water, wood and forage of the reserves are conserved and wisely used..." (315)

1. Watershed Management.

Watershed Management has been a basic consideration of all National Forest Management programs. The maintenance of favorable conditions of waterflows was one of the objectives stated in the 1897 Act. Public concern about floods was largely responsible for the enactment of the Weeks Act of 1911. (316) This Act authorized and directed the Secretary of Agriculture to examine, locate and recommend for purchase those forested, cut-over, and denuded lands within the watersheds of navigable streams as in his judgement may be necessary to the regulation of the flow of navigable streams or for the production of timber. Watershed protection has been a primary reason for fire control on many National Forest areas. (317)

Watershed Management is the protection, conservation and wise use of the natural resources within a drainage basin aimed at keeping the soil mantle in place and making water available in a manner which best serves human requirements. National Forest System lands are the most important watershed lands under a single jurisdiction in the United States. In the 11 Western States, more than one-half of the stream flow comes from the National Forests. In the East, National Forest lands are situated at the stream headwaters and produce high-quality water. Water from National Forests is valuable for domestic supplies, irrigation, power, industry, fish and wildlife, and recreation. It is basic to the economy of many areas. (318)

Watershed restoration and improvement consist of land-treatment and structural works and of scientific water management. These programs are designed to restore site productivity, improve land stability, and enhance the timing, amount, and quality of water produced on National Forest Systems. (319)

In order to ensure water availability for the needs of the National Forest System, the Forest Service initiated the Reservation Doctrine. This is a philosophy of the Forest Service resulting from the provisions of the Department of Agriculture Organic Act of 1944. It provides for the Forest Service to reserve for its own use, in the management of National Forests for the benefit of the public, such waters as originate in the National Forests. This reservation takes precedence over all other uses of these waters. With the current great demand in the West for water for other uses, this doctrine is being challenged.

2. Recreation Management.

The most definitive authority for management and development

of the National Forest System recreation resources is the Multiple Use-Sustained Yield Act of June 12, 1960 (16 U.S.C. 528-531). This Act proclaimed the policy that the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed, wildlife, and fish purposes. (320)

Competition for water is intense on many National Forests. Water is important to proper development, maintenance, management and use of recreational areas. For example, water is needed for domestic purposes, swimming, irrigating meadows and tree plantings, stock watering, and maintaining proper conditions for wildlife. (321)

3. Wild and Scenic Rivers.

P.L. 90-542, 90th Congress, S. 119, October 2, 1968, established a National Wild and Scenic River System. It declared that it is the policy of the United States "that certain selected rivers of the Nation which....possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations". (322)

The Act provided for three river classifications. These are:

a. Wild river areas - Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.

b. Scenic river areas - Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

c. Recreational river areas - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. (323)

The Act designated eight rivers as the initial components of the system. The Secretary of Agriculture, through the Forest Service, administers four of these and shares in the administration of two others.

Initial Components

Rio Grande, N. Mex.
St. Croix, Minn. and Wisc.
Wolfe, Wisc.
Eleven Point, Mo.
Middle Fork Feather, Calif.
Middle Fork Clearwater, Id.
Middle Fork Salmon, Id.
Rogue, Ore.

Administered by (324)

USDI (BLM); USDA (FS)
USDI (NPS)
USDI (NPS)
USDA (FS)
USDA (FS)
USDA (FS)
USDA (FS)
USDA (FS); USDI (BLM)

The Act also designated 27 rivers for detailed study as potential additions to the system. USDA (FS) provides study leadership for nine of these study rivers. (325) As of September 1977, studies had been completed on two (Chattooga, Ga., N.C., S.C.; Flathead, Mont.) and they had been added to the National system; studies had been completed on three (Skagit, Wash.; Pere Marquette, Mich.; Salmon, Id.) and they had been included in draft legislation to add them to the National system; the Secretary's report and recommendations on the Saint Joe, Id., had been sent to the President through the OMB, March, 1977; the Secretary's proposed report on the Illinois, Ore., was under agency review; studies were ongoing on the Moyie and Priest, Id. (326)

P.L. 90-542 has been amended three times:

- a. P.L. 92-560, January 1972, added the Lower St. Croix to the National system.
- b. P.L. 93-621, December 3, 1974, designated an additional 29 rivers for study. USDA (FS) has leadership on 13 of these studies and joint leadership with USDI on three others. The joint study of the Dolores, Colo., has been completed and is included in draft legislation.
- c. P.L. 94-199, December 1975, added the Middle Snake and Rapid Rivers, Id. and Ore., to the National system, administered by USDA (FS). It also designated the Lower Snake for study, USDI leadership.

4. Dams.

FS has a complex involvement with dams because of the diverse legislation which directs its actions. It has some degree of administrative control over more than 15,000 dams. Most of these are small, low-hazard structures. However, over 1,300 are of a size and height to be included in the National Dam Safety Act inventory.

Rural Electrification Administration (REA)

The REA was established as a relief organization in 1935. It changed from a construction to a lending agency for the establishment of electric power stations and lines in 1936. The REA helps in the organization of cooperatives and with their program plans. Generally, the cooperatives reach areas that commercial companies would consider unprofitable. In 1935, ten percent of the farms were receiving central power station electric service; in 1939, 20 percent; and by 1970, 98 percent. At the beginning of the 1970's, only 50,000 of some 3.15 million farms were not receiving such service. (327)

Since REA is a lending agency dealing with electric power and telephone service, it has only indirect impact on water resources. However, as of January 1, 1977, out of 244 generating units which it had financed, 20 were hydro units and 69 were steam units. (328) Each of these types is dependent upon an adequate water supply. Most steam plants take water from a river or ground water. Both are in critical supply.

Dams are an essential element of hydroelectric generating plants. They also are used to store large quantities of water for thermal electric plants. REA does not design, build or own dams. They are the responsibility of the recipient of REA loans for construction. Cooperatives get water use permits or buy up water rights for their supply. This conflicts with agricultural as well as other uses.

In 1970 REA had made \$300 million in loans. By 1977 this had increased to \$5,000 million. Due to the demand for energy, it is expected that the magnitude of the REA program will continue to increase. REA is encouraging the Cooperatives to promote conservation and multiple use of water such as using cooling water for irrigation. It has fewer water problems in the East and Southeast than in other sections of the Nation.

Soil Conservation Service (SCS)

While the major water resource programs of SCS have been discussed in previous chapters, it has several other programs which have major water resource implications.

1. Conservation Operations (C.O.) and Great Plains Programs (G.P.).

These programs basically deal with the planning and application of measures on farm and ranch lands for the conservation and effective utilization of available soil and water resources. Both programs are based on farm and ranch plans developed with the assistance of soil and water conservation districts. Cooperating landowners or operators with the Conservation Operations program finance their own measures or get such help as is available through the ACP. Cooperators in the G.P. program enter into long-term contracts with guaranteed cost-sharing for the life of the agreement. Eligible measures include those for the control and management of surface run-off and inherent high water tables. Farm and ranch ponds have been discussed in a previous chapter. As of June 30, 1976, 1,239,434 miles of terraces and 105,530 miles of diversions had been installed to control and manage surface run-off. Two other water resource practices, on-farm irrigation and drainage, merit further discussion.

a. Irrigation

Irrigation is one of the first water resource activities in which USDA became involved. The current policy of SCS regarding it is to provide technical assistance to land users to achieve effective and efficient use of irrigation waters to ensure a continued productive irrigated agriculture, to reduce soil erosion and downstream sedimentation, and to prevent or minimize degradation of water quality. "Conservation irrigation is simply using irrigated soil and irrigation water in a way that will insure high production without the waste of either water or soil. It means the use of cropping, irrigation and cultural practices that will maintain the land in permanent agriculture." (329)

A high degree of irrigation efficiency is essential to conservation irrigation. This means that a high percentage of the water applied to an irrigated field must be retained in the root zone for use by the crop. This requires a proper rate of application with respect to soil characteristics, and the timely application with respect to rate of crop usage. Deep percolation must be avoided and surface run off and resulting erosion held to a minimum.

As of June 30, 1976, SCS had provided technical assistance on the installation of surface and subsurface irrigation systems on 20,343,679 acres, and in providing irrigation water management on 25,859,136 acres. (330)

b. Drainage

On December 3, 1938, Secretary of Agriculture, H. A. Wallace, assigned to H. H. Bennett, Chief of SCS, drainage and irrigation responsibilities previously held by the Bureau of Agricultural Engineering. (331) SCS already was involved in drainage work and had been since the assignment of the Civilian Conservation Corps (CCC) in 1935. CCC drainage camps assigned to SCS were working with organized drainage enterprises and associations.

The question of SCS providing drainage assistance to soil conservation districts was settled in 1941 by Field Memorandum SCS-976. This authority was further established in April, 1946, when the Secretary concurred in a memorandum that outlined how drainage fits in with the programs of soil conservation districts.

There was no restriction on USDA drainage activities until 1956 when the ACP National Bulletin restricted cost-sharing where the primary purpose of drainage systems was to bring new land into agricultural production. SCS adopted this policy for both the Conservation Operations and watersheds programs.

Beginning in 1963 and in each succeeding year the Agricultural Appropriations Act prohibits the use of cost-sharing funds or technical assistance for the drainage of Wetland Types 3, 4, and 5, as defined in USDI's Fish and Wildlife Circular 39. The area of controversy about drainage concerns the assistance given to farmers by SCS and ASCS. The basic contention has been that two Federal agencies are in direct conflict. The USDI, through the BSFW, has been attempting to save wetland by purchase and lease and objects to the modification of any wetlands. The USDA, through its programs of technical and financial assistance, helps and encourages farmers to drain wet croplands for more efficient production. Such activities often result in drainage of some adjacent wetlands. The Water Bank Program is an exception.

SCS programs and activities aim toward the achievement of a reasonable balance between continued and efficient production of food and fiber and maintaining environmental quality. Neither should completely supersede the other. Many farmers need drainage assistance, including

major outlets, for sustained production. Since approximately one-fourth of the Nation's total cropland has an excess water problem, effective farm drainage is of critical importance to the Nation's economy.

2. Resource Conservation and Development Program (RC&D)

Resource Conservation and Development Projects are initiated and carried out by qualified local sponsors with assistance of state and USDA agencies. USDA assistance is provided under the following authorities: Soil Conservation Act of 1935 (P.L. 74-46); Title III of the Bankhead-Jones Farm Tenant Act, Sections 31 and 32c, as amended by Title I, Section 102, Food and Agriculture Act of 1962 (P.L. 87-703, 76 Stat. 607), and further amended by P.L. 89-796, 80 Stat. 1478.

RC&D Projects help people take better care of their natural resources and improve their community's economy. These projects are locally initiated, sponsored, and directed. They provide a base for people to come together to plan and carry out actions that will make their project area a better place in which to live, work and play. (332)

USDA provides technical and financial assistance to the sponsoring local groups. It also helps them seek funds and services from other Federal, state and local sources. The SCS has leadership for USDA in the RC&D Program. (333)

The local sponsors develop their own programs and goals. These include, among other things, the development of land and water resources for agricultural, municipal, and industrial use, and the implementation of such measures as sediment control, flood prevention, farm irrigation, and recreation, fish and wildlife developments. They may make use of any other available program authorities in achieving their goals. RC&D Projects usually include more than one county. (334)

As of June 30, 1976, 168 project areas had been authorized for assistance covering 704,470,000 acres. There were an additional 60 applications on hand covering 264,325,000 acres. RC&D measures completed amounted to 10,533. There is no record immediately available as to how many of these are water resource measures. (335)

3. Snow Surveys

As a result of the unprecedented Western drought of 1934, agricultural interest expressed to USDA a demand for general and specific information on water supplies that could be expected to be available during the ensuing growing season. Both the Weather Bureau and the Forest Service were considered as the USDA agency to conduct and coordinate the snow survey program. Both agencies objected and Congress selected the Bureau of Agricultural Engineering to operate the program. In the Appropriation Act of 1935 it included \$36,000 for the Bureau to initiate this activity. On July 1, 1939, the Division of Irrigation of the Bureau of Agricultural Engineering was transferred to SCS and continued to conduct

these surveys until June 30, 1953. On July 1, 1953, the research work of SCS was transferred to the ARS but the Snow Survey Program remained with SCS. On July 1, 1940, the Weather Bureau was transferred from USDA to the Department of Commerce. Section 8 of Reorganization Plan 4 specifically authorized USDA to continue to make snow surveys. Based on P.L. 74-46 and the above described authorities SCS has provided the leadership and participated in the operation and direction of the cooperative snow survey activity in the Western States since 1935. (336)

The first known survey in the U.S. was reported in 1834. The first known survey with a documented measurement method was reported in 1900. The first western snow surveys were made on Mt. Rose in the Sierra Nevada Mountains in 1906. The State University of Nevada began snow surveys in 1910; the Bureau of Reclamation started some in Washington in 1915 and in Wyoming in 1919. Some of the other Western states followed suit and by 1935 at least nine independent snow survey networks were operating in the West. Since 1935 SCS and predecessor agencies have conducted snow surveys in the Western States with specific emphasis on assistance to agricultural interests. (337)

The program presently is conducted in line with SCS policy. Priority is given to providing program data suited to the needs of agricultural water users, particularly those served by the soil and water conservation districts. In the states served, there are 1,700 snow courses, 200 aerial snow-depth markers, 200 soil moisture installations and 300 precipitation gauges. Data collected include depth and water content of snow, soil moisture, precipitation and soil and air temperatures. Data are collected both manually by SCS personnel and cooperators and through an automatic telemetry system in some areas. (338)

To meet more sophisticated needs, SCS has initiated installation of an automatic telemetry system in remote areas to replace the often hazardous manual system of collecting snow data on a monthly basis. The telemetry system will consist of approximately 500 data-collection sites, two central stations, a base station computer/controller in Portland, Oregon, and terminals in the SCS state offices of the 11 Western States. The manually measured snow courses network will be reduced from the present 1,700 to about 1,200. (339)

The manual measurements are made three to six times, or more frequently, during the winter months, beginning as early as December 1 and continuing until May or June 1, depending upon elevation and latitude. To do this work, SCS operates a large fleet of oversnow machines, numbering approximately 25 large, 10 medium, and more than 100 small, one-man types. Both fixed-wing aircraft and helicopters also are used on a contract basis for transportation into the data sites. (340) The data are used for farm and ranch operations, reservoir management, recreation, municipal, industrial and other management activities. (341)

Listed below are representative SCS budget obligations from 1935 to 1965 and annual obligations from 1970 to 1978:

FISCAL YEAR	OBLIGATIONS
1935	\$ 36,000
1945	60,000
1960	381,000
1965	591,000
1970	792,669
1971	836,629
1972	890,743
1973	1,039,856
1974	1,115,727
1975	2,144,702
1976	3,208,191*
1977	2,251,691
1978 (EST.)	4,300,000*

* Includes funds for a large instrumentation contract not yet completed.

Snow survey data are available on request to all Federal, state and private parties who need them. The average annual potential benefits to irrigated agriculture are \$43,436,000. The average annual cost of the manual snow survey program is approaching \$1,500,000 for FY 1978. Implementation of the automatic telemetry program will increase annual potential benefits to agriculture to a range of \$47,836,000 to \$50,037,000 and average annual costs to \$2,500,000. The estimated benefit-cost ratio of the entire snow survey program is about 20 to 1. (342)

- 1/ Reorganized as a part of Science and Education Administration.
- 2/ Reorganized as a part of Economics, Statistics, and Cooperatives Service.

CHAPTER 9

INTERAGENCY COORDINATION

Following the dissolution of the National Resources Planning Board in 1943, President Roosevelt issued Executive Order 9384. This order directed that all public works construction agencies prepare, and keep up to date, long-range programs that must be submitted annually to the Bureau of the Budget. This order appeared to give the Bureau of the Budget (BOB) much of the authority to coordinate construction agency planning that the National Resources Planning Board had possessed. But Congress didn't agree with this position. In 1945 it refused to appropriate money for a proposed BOB division which would coordinate the Federal public works programs. It stated that the New Federal Interagency River Basin Committee could adequately undertake this function. (343)

The Federal Interagency River Basin Committee (FIARBC)

When the National Resources Planning Board (NRPB) was dissolved, the Tripartite Agreement gave way to a similar agreement between the Departments of the Interior, Army, Agriculture, and the Federal Power Commission. This new agreement established the Federal Interagency River Basin Committee (FIARBC), which came to be known as "Firebrick". This Committee attempted to continue the coordination function that had been carried out by the National Resources Planning Board in the Executive Office of the President. It was a voluntary organization without central executive supervision or statutory powers conferred by Congress. The Department of Commerce became a member of the Committee in 1946, the Federal Security Agency in 1950, and the Department of Labor in 1953. The Committee was composed of departmentally designated representatives, generally just below sub-cabinet level. Its purpose was to permit the member agencies "to cooperate more completely in the preparation of reports on multiple-purpose projects and to correlate the results to the greatest practicable extent". The bulk of the work of FIARBC was carried out through subcommittees and the regional committees. (344)(345)

The ability of FIARBC to achieve coordination between agency programs was limited in several ways. It had no statutory standing and no budget. Its decisions were advisory only. Their interpretation depended upon the voluntary cooperation and individual consent of its member agencies. In addition, the agencies' abilities to cooperate frequently were limited by statutory provisions relating to their powers and duties. (346)

FIARBC set up regional interagency committees for specific river basins: the Missouri (MBIAC) in 1945, the Columbia (CBIAC) in 1946, the Pacific Southwest (PSIAC) in 1948, and the Arkansas-White-Red (AWRBIAC) and New England-New York (NENIAC) in 1950. AWRBIAC and NENIAC were chaired by the Corps of Engineers. The other committees rotated the chairmanship

among the member agencies. All the committees included representatives of the affected states. Generally, unanimous consent was required for the committees to take action. One of the difficulties with the regional committees was that they were not able to reconcile separate agency plans and policies to the point of providing the integrated river basin plans that had been the objective of the NRPB. (347) USDA was a member and active participant not only of FIARBC but also each of the river basin committees. It took its turn at chairing each of the three western committees.

Official Study Commissions

1. U. S. Commission on the Organization of the Executive Branch of the Government, 1949. (First Hoover Commission)

The first Hoover Commission was a bipartisan organization, with members appointed by both the President and Congress. It recommended the formulation of a Water Development and Use Service in the Interior Department. This would bring together the rivers and harbors and flood control functions of the Corps of Engineers with the reclamation and power activities already in the Department. It also recommended the creation of drainage area commissions representing the proposed new Service, the USDA, and the affected states. The purpose of these commissions would be coordinating and advisory. In addition, it recommended the creation of an independent board in the Office of the President to review all project proposals of the reorganized Interior Department from the time they were first proposed. It would also periodically evaluate and give advice as to the continuance of authorized projects. (348)

None of the proposals of the first Hoover Commission was adopted. While President Truman supported the proposal to transfer the civil works functions of the Corps of Engineers to the Department of the Interior, it was rejected by Congress. (349)

2. The President's Water Resources Policy Commission, 1950.

This Commission of independent experts was chaired by Morris L. Cooke, the former chairman of the Mississippi Valley Committee of the Public Works Administration. Hence, it often was referred to as the Cooke Commission. This Commission was established on January 3, 1950. It saw water resources development as a means to balanced regional economic development which was needed to strengthen the entire nation. It observed that the post-World War II period was one of population growth, urban concentration, and industrialization. It considered that these changes probably would lead to a new set of water resources problems. It envisioned these problems as mainly involving the inhibition of economic growth by future water shortages. (350)

The Cooke Commission also favored organizational consolidation into a Department of Natural Resources. It proposed that Congress set up interagency river basin commissions for each major basin. The work of

these basin commissions would be reviewed by a board of review in the executive branch. This board would have authority to appraise all findings of economic feasibility and consider all proposals from the point of view of the total National interest. It also would be authorized to develop uniform evaluation techniques for guidance of Federal agencies. No new water planning legislation was introduced as a result of this report, but it is reported to have inspired the Bureau of the Budget to issue Circular A-47. (351)

3. Subcommittee to Study Civil Works of the House Committee on Public Works, 82d Cong., 2d Sess., 1952.

On August 20, 1951, the House Committee on Public Works resolved that its chairman appoint a special subcommittee to study the policies, practices, and procedures in connection with the authorization and construction of river-and-harbor and flood-control projects. (352) This committee, known as the Jones subcommittee, recommended that coordination of Federal planning on the river basin level be effected through congressional policy determination and project authorization. It stated that Congress should insist that agencies should coordinate their programs. This could be brought about by Congress refusing to authorize conflicting program elements. (353) It believed that no segment of a plan should be approved by any committee or enacted by Congress so long as major conflicts existed between such segment and the parts properly under the jurisdiction of some other element of the executive branch. (354) It further stated that Congress should issue policy statements establishing (a) uniform standards for economic justification of projects by all executive agencies, and (b) uniform standards for allocation of costs in multiple-purpose projects and uniform criteria for the sale of products to recover such costs. (355)

The Jones subcommittee also had its own executive reorganization proposal. It concluded that a separate upstream program in USDA was not required. It thought that the relationship of upstream run-off control to downstream flood control works was a technical problem. This recommendation of the subcommittee was nullified by the House Agriculture Committee which already was involved in the legislative history of Public Law 566 which became law in 1954. (356)

4. Commission on Organization of the Executive Branch of the Government, 1955.

This Commission is now commonly known as the Second Hoover Commission. It stated in its report: "The economic development and conservation of water resources is vital to the future of the United States. Soundly conceived, efficiently executed, timed for our needs, it can strengthen the economy. Good development can supply new communities and growing cities with water, provide for expanding industries, open paths for transportation, water arid acres, generate power and establish means for recreation. Its management can conserve flood waters for doing useful work, and can contain, or at least reduce, floods that otherwise would endanger human lives and waste the substance of farm, factory, and city." (357)

The Commission was concerned that USDA had entered the flood control field with its upstream watershed program. It felt that this program, designed originally to treat land so as to check run-off, had rapidly developed to include constructing engineering works in competition with the Corps of Engineers. (358) In fact, it felt so strongly about this development that it recommended that Congress enact legislation assigning to the Corps of Engineers all construction work justified primarily for flood control and that the SCS not be authorized to undertake these tasks on any basis whatsoever, and further that land treatment programs be undertaken primarily for purposes other than flood control. (359)

The Commission advocated two measures to promote central executive branch control of water resource planning: (a) strengthening the Bureau of the Budget to enable it to evaluate the merits of water development projects, and (b) the creation of a Water Resources Board in the Executive Office of the President which would be empowered to make policy recommendations and coordinate agency planning both in Washington and in the field. (360)

5. Presidential Advisory Committee on Water Resources Policy, 1955.

President Eisenhower set up this Cabinet-level committee (consisting of the Secretaries of Agriculture, Defense and the Interior) before the Hoover Commission had completed its work. It issued its report on December 22, 1955. It declared that: "A sound water policy must look forward toward an adequate supply of water for our people, prevent waste, reduce water pollution to its lowest practicable level, provide means for the best and most effective distribution of water, improve navigation, and take steps to check the destructive forces of water which destroy land, property and life." (361)

It recommended that: (a) the position of Coordinator of Water Resources be established to provide Presidential direction to agency coordination and to establish principles, standards, and procedures for planning and development of water resources projects; (b) an independent Board of Review be created to analyze the engineering and economic feasibility of projects; (c) regional or river basin water resource committees be formed with a permanent nonvoting chairman appointed by the President; and (d) a permanent Federal Inter-agency Committee on Water Resources be established under the Chairmanship of the Coordinator. (362)

The Committee further recommended that the evaluations of water projects by all agencies be on a uniform basis; that, as a general policy, all interests participate in the cost of water resource development projects in accordance with the measure of their benefits; and that the Federal Government assume the cost of that part of projects where benefits are national and widespread and beneficiaries are not readily identifiable. (363)

The immediate reaction of the Senate's Committees on Public Works and Interior and Insular Affairs to this report was Senate

Resolution 281 of the 84th Congress. This resolution stated the opposition of the Senate to any attempt by the President to appoint a coordinator or board of review by Executive Order as an Executive infringement of Congressional powers. The resolution also opposed Budget Bureau Circular A-47 and its proposed revision. (364)

6. Senate Select Committee on Water Resources.

A brief statement about this Committee and its establishment has been given in Chapter 6. This statement included a discussion of the Committee's first recommendation. Other pertinent recommendations are:

- a. That the Federal Government stimulate more active participation by the states in planning and undertaking water development and management activities;
- b. That a periodic assessment of water supply-demand relationships be made biennially for each of the water resource regions of the United States;
- c. That a Federal program of coordinated scientific research on water be implemented;
- d. The adoption of a series of steps to encourage efficiency in water development and use. (365)

The Select Committee also considered Federal reorganization and consolidation of Federal water resource agencies. While it favored fewer Federal agencies operating in the water resources field, it had doubts about the efficacy of a new consolidated water agency. (366)

Interagency Committee on Water Resources (ICWR)

When the administration changed in 1953 there was a reappraisal of interagency coordination on water resources. In May 1954 President Eisenhower requested that FIARBC be reconstituted as the Interagency Committee on Water Resources (ICWR). This Committee was to have members of sub-Cabinet rank and to include the new Department of Health, Education and Welfare as successor to the Federal Security Agency. The Departments of Commerce and Labor agreed to participate in associate member status. The ICWR (or "Ice-water" as it soon became known) rechartered the FIARBC regional interagency committees and the technical subcommittees and continued the FIARBC pattern of meetings to facilitate coordination of the activities of its member agencies. (367)

The ICWR did not undertake discussion of major water policy questions, pending possible submission of proposals for water policy legislation by the Cabinet-level Presidential Advisory Committee on Water Resources Policy. After Congress' cool reception of the Advisory Committee's 1955 proposals no further proposals were made by ICWR. (368)

Coordination of Project Evaluation

1. Bureau of the Budget Circular A-47.

On December 31, 1952, the Bureau of the Budget sent its Circular A-47 to the heads of agencies having responsibility for the development of water and related land resource programs. It stated that the Circular was designed to set forth the standards and procedures which would be used by the Executive Office of the President in reviewing proposed water resource project reports and budget estimates to initiate construction of such projects. (369)

The authority for the Circular was cited as Executive Order 9384, October 4, 1943. This Circular supplemented the requirements of the Executive Order and BOB Circulars A-11 and A-19. It related to Federal programs or projects for the conservation, development, or use of water and related land resources. (370)

Circular A-47 defined the benefits to be included in the evaluation (371); the costs to be included (372); and specified that benefits and costs should be converted to a common time basis (373). It not only required that total benefits should exceed total costs but also that the benefits of each purpose in a multiple purpose project must exceed the cost of including that purpose. (374)

The requirements of Circular A-47 were criticized by both major congressional water resource committees and the construction agencies as being unduly restrictive. Many Congressmen considered them an executive usurpation of congressional powers. (375)

2. Proposed Practices for Economic Analysis of River Basin Projects.

This report was prepared by the Subcommittee on Benefits and Costs of FIARBC. It was submitted to FIARBC on May 15, 1950. USDA was active in the preparation of this report. Ernst H. Wiecking, Office of the Secretary, USDA, was a member of the subcommittee during 1949 and 1950 and served as its chairman in 1949. Mark M. Regan was a member of the subcommittee staff during 1949-1950. He was from the Division of Land Economics, Bureau of Agricultural Economics, USDA. (376)

This report became known as the "Green Book". Although it was approved by the various member agencies of FIARBC, it was not binding on any of them. The Bureau of Reclamation refused to accept restrictions on the use of secondary benefits in project justification; the Corps of Engineers rejected the use of future prices for determining costs; and other agencies accepted certain parts and rejected others. (377) The Green Book probably was instrumental in BOB's issuance of Circular A-47.

Upon approval by the President on May 26, 1954, of ICWR to succeed FIARBC, the Subcommittee on Evaluation Standards was established with

duties which included continuing the activities begun under the predecessor Subcommittee on Benefits and Costs. The ICWR, on August 12, 1958, authorized the reissuance of the May 1950 Report, as revised, and its adoption as a basis for consideration by the participating agencies in the evaluation of river basin developments. (378)

USDA was actively involved in the preparation of this revised report. Ernst H. Wiecking, again, was USDA's member on the Subcommittee. Carl Ford, SCS, William A. Green, ARS, and Mark M. Regan, ARS, were members of the Subcommittee staff. (379) As with the "First Green Book", all concerned agencies did not fully adopt and follow the provisions of the "Second Green Book".

3. Policies, Standards, and Procedures in the Formulation, Evaluation, and Review of Plans for Use and Development of Water and Related Land Resources, S.D. 97.

In a memorandum of October 6, 1961, President Kennedy requested the Secretaries of the Interior, Agriculture, Army, and Health, Education and Welfare to review existing evaluation standards and to recommend improvements. The resulting report was approved by the President on May 15, 1962, and published as Senate Document No. 97, 87th Cong., 2nd Sess. This document replaced Budget Bureau Circular No. A-47. (380)

S.D. 97, for the first time, recognized development, preservation and well-being of people as co-equal planning objectives. However, plans were to be formulated initially on the basis of economic benefits and costs and then adjusted to take account of intangibles such as preservation and well-being of people. In actual plan formulations in subsequent years, preservation and well-being were not given co-equal consideration with development. Moreover, since the early 1960's, Congress has enacted many laws that have given new and more definitive directions for considering environmental objectives in planning for water and related land resources. (381)

The Water Resources Council has developed principles and standards for planning water and related land resource developments in accordance with the directives of the Water Resources Planning Act. These were approved by the President in September, 1973 and replaced S.D. 97. These are discussed in Chapter 10.

CHAPTER 10

THE WATER RESOURCES PLANNING ACT OF 1965

Title I of the Water Resources Planning Act of 1965, P.L. 89-80, July 22, 1965, established the Water Resources Council. The Act designated the Secretary of the Interior, the Secretary of Agriculture, the Secretary of the Army, the Secretary of Health, Education and Welfare, and the Chairman of the Federal Power Commission as Council Members. (382) The Secretary of Transportation was added as a member later by the Act creating that Department. The heads of other concerned agencies were invited by the Chairman of the Council to participate in the activities of the Council either as associate members or observers. During the last few years the Department of Housing and Urban Development, the Department of Energy, the Environmental Protection Agency and the Council on Environmental Quality have become members. Other agencies such as Office of Management and Budget, Attorney General and River Basin Commissions participate as observers.

The Council is to meet regularly at least four times a year upon the call of the chairman or at the request of a majority of the members. As a matter of practice, it has met much less frequently. The Council decides issues by a majority vote, except that decisions affecting the authority or responsibility of any member can be made only with his concurrence. (383)

A comprehensive discussion of the Water Resources Council and its responsibilities and activities under P.L. 89-80 is beyond the scope of this document. Excellent discussions in this depth are found in "The Water Resources Council" by Ernst Liebman, May 1972 (384), and in Chapter 10, "A History of Federal Water Resources Programs and Policies, 1961-1970" by Beatrice H. Holmes, which, at this writing, is under review for publication. Discussions herein will be focused on the role of USDA in WRC activities.

Cabinet-level officials are very busy people. Membership on the Water Resources Council was an added responsibility. It is very difficult to find a date when all or even most of the members can be present. As a result, meetings became infrequent and, when they were held, they usually were attended by the Secretary of the Interior, who was Chairman, the Chairman of FPC, and designees or alternates for the other members. Usually, these were assistant secretaries. (385)

In late 1973 or early 1974, the designees or alternates for the Secretaries of Agriculture, the Army, and the Interior became concerned that the Council was not providing adequate guidance to the Staff and member agencies. They, with the concurrence of the Members, set up an active Council of Alternates which meets at least each three months to provide the necessary leadership and guidance from the Secretary level. Mr. Robert W. Long was the Assistant Secretary of Agriculture involved. He was really

the first Assistant Secretary in USDA who had taken an active interest in the WRC and its activities. The Council of Alternates (COA) added a new and positive dimension to WRC activities. Dr. Rupert Cutler, current Assistant Secretary of Agriculture, continues an active interest and participation in the Council of Alternates.

The basic working group of WRC is the Council of Representatives (COR). This was a carry-over from the Interdepartmental Staff used by the ad hoc WRC. The members of this group were designated representatives from top agency staff within the respective Departments. USDA's representative until mid-1972 was Hollis R. Williams, Deputy Administrator for Watersheds, SCS. William B. Davey and Joseph W. Haas have succeeded him in this role. The COR was very active, meeting every week or more often much of the time. It was here that agency differences were discussed and often reconciled. A better understanding and acceptance of agencies' objectives, authorities, constraints and procedures was achieved. The COR gave direction to WRC committees, task forces, and special study teams. The USDA members have ensured that USDA interests were recognized and properly respected in COR actions.

COR actions are limited to those of unanimous consent of the member agencies. If unanimity cannot be achieved, issues are sent to the members for resolution. Certain decisions are reserved solely for the members: actions requiring Presidential action or approval, decisions involving substantial policy issues, submission to the President of nominations for chairmen of river basin commissions, approval of annual budget requests and annual operating program, delegations of authority, issues of invitations to become associate members or observers, appointment and termination of appointment of executive officers and associate director, and approval of rules and regulations. (386)

The WRC is assisted by a staff which is headed by a Director. Many of the major functions were carried out through committees. There were three administrative committees and four technical committees. The administrative committees were Policy Development, Federal-States Program and State Grants. (In 1977 all administrative and technical committees of WRC were discontinued.)

The Policy Development Committee was chaired by an Assistant Director of the WRC staff. Its membership consisted of individuals designated by the members of the Council. Associate members and observers could be represented. USDA was represented on this Committee by a Division Director or an Assistant Deputy Administrator of SCS. At the COR level and on all committees the SCS member was accompanied by and consulted with a representative of Forest Service and ERS. This arrangement ensured adequate consideration of all USDA interests in water resource issues. This Committee was concerned with such issues as flood plain management; cost-sharing; the OBERS system of economic projections; recreation and fish and wildlife; implementing procedures, guidelines and handbooks; development of new policies for benefit sharing, stream-flow regulation, and land use; and a follow-up in the principles and standards. USDA involvement in each of

these activities required many man-hours of time from individuals in several divisions from SCS, FS and ERS. (387)

The other Assistant Director, WRC, chaired the Federal-State Program Committee and the State Grants Committee. This Committee helped the Council carry out the National assessment; prepare and coordinate budgets; review the river basin planning programs and reports; and tried to build up coordination between states and Federal agency planning. The Director, River Basins Division, SCS, with FS and ERS participation, was the USDA member on this Committee. Its varied activities required inputs from many SCS staff members. The State Grants Committee made recommendations to COR regarding the distribution of available grant funds among the various states. (388) The work of this Committee was assigned to the Federal-State Program Committee in recent years.

In addition to the three administrative committees mentioned above, there were four technical committees; namely, economics, hydrology, sedimentation, and vector control. USDA was represented on each of these committees. These committees were concerned specifically with developing guidelines and instructions in their respective fields which could be used by concerned agencies in program implementation. (389) Some examples of such publications are: OBERS Series C Volumes 1-5, Sept. 1972; OBERS E' Supplement to Volumes 1, 3, 4, and Guideline 3; OBERS E' Baseline Projections, Agencies and Individuals, June 1975; A Study of Mosquito Prevention and Control Problems Associated with Stream Modification Projects, Oct. 1974; Flood Hazard Evaluation Guidelines for Federal Executive Agencies, May, 1972; and Guideline 2 - Agricultural Price Standards, Oct. 1976. USDA was heavily involved in the preparation of each of the above listed publications as well as many others, such as the Summary, National Conference on Water, April 22-24, 1975. (390)

River Basin Commissions

Title II, P.L. 89-80, authorized the establishment of river basin commissions. The President is authorized to establish such a commission upon a request by the Council or by a state which lies wholly or partly within the basin or basins concerned, with the concurrence of at least one-half the states within the basin. (391) The commissions are directed to make studies and recommendations pertaining to the conservation, development and utilization of water and related land resources of the United States, to make annual reports to the Council and the Governor of each participating state, and to prepare and submit to the Council a comprehensive, coordinated, joint plan (CCJP) for the development of water and related land resources of the river basin concerned. (392)

By September of 1967, river basin commissions had been established for the Pacific Northwest, the Great Lakes, New England, and the Souris-Red-Rainy basins. On January 13, 1971, the Ohio River Basin Commission was established and on March 24, 1972, the Missouri River Basin Commission and the Upper Mississippi River Basin Commission were established. The Upper Mississippi RBC took over the area and responsibilities of the Souris-Red-

Rainy RBC which was dissolved. Thirty-two states are members of one or more of these commissions. (393)

In addition to the six river basin commissions, there are three interagency committees which also operate under the guidance of the WRC. These are the Pacific Southwest Inter-Agency Committee (PAIAC), the Arkansas-White-Red Interagency Committee (AWRBIAC), and the Southeast Basins Inter-Agency Committee (SEBIAC). The Committees formerly had operated under the directions of ICWR. Three of the original interagency committees, the Columbia, the Missouri, and the New England-New York, had been replaced by river basin commissions.

USDA participates actively on each of the river basin commissions and the inter-agency committees. The designated USDA member of each river basin commission and interagency committee is the SCS State Conservationist from a selected state within the basin area. This state conservationist is designated by the Secretary and represents all USDA interests within the basin, including the other SCS state conservationists. On actions of interest to USDA, he consults with a representative each of the Forest Service and ERS, who attend the commission meetings.

The National Assessment

The Water Resources Planning Act requires the Council to prepare an assessment of the adequacy of water supplies necessary to meet the needs of the various regions of the United States. Section 102(a) of the Act states that the Council shall maintain a continuing study and prepare an assessment biennially or less frequently as the Council may determine.

One of the first tasks of the new WRC was to prepare an assessment. The first assessment was published in November 1968. About 8,000 copies of the assessment, "The Nation's Water Resources", and 13,000 Summary Reports were distributed. This assessment surveyed the water supply-demand outlook for each of the 20 water resource regions of the Nation. It defined the current and projected regional and national water needs and the current and prospective action necessary to meet those needs. The preparation of the assessment involved the coordinated efforts of many Federal, state and regional agencies. USDA participated in this effort at both the national and field levels. (394)

Because of time and data limitations, the continuing assessment was divided into three phases. Phase I was to be an initial assessment of the adequacy of the national water supply based on available data and limited analysis. The First National Assessment was of this type. Phase II was to use more fundamental analytical frameworks, more detailed measurements, and would utilize the findings of the comprehensive framework program which the Council had underway. Computer simulation models would be used in this second phase. Phase III would be a continued refinement of Phase II. (395) The Second Assessment is underway and should be published in 1978 or 1979.

USDA is deeply involved in the preparation of the Second National Assessment. Some of its contributions are:

1. Crop Consumptive Irrigation Requirements and Irrigation Coefficients for the United States.

This study and report are a product of the SCS. The objective of SCS was to determine the nation's irrigation water requirements. The National Water Assessment is an evaluation of the nation's resources needs and capabilities and identification of present and emergency water problems. Special emphasis is placed on identifying national and regional resources that are in critical supply. Water resource needs of agriculture require such special attention. (396)

2. Erosion and Sedimentation and Resource Considerations.

This report prepared by USDA is an Appendix to the National Water Assessment. It is comprehensive in that it covers overland (including erosion amounts and rates, effects, and control practices from the "Cropland Erosion" special study), streambank and shoreline erosion and sedimentation processes. It provides data on problem areas, damages, controls, and options. The data are current estimates (1975) and projections to 2000 presented for the 106 ASA's. (397)

3. Domestic Water Use from Non-Central Systems.

This report, prepared by SCS, provides estimates of the population served and domestic water required by non-central water systems. The estimates are for current (1975) and future (1985 and 2000) years at the 106 Aggregated Subarea (ASA) level of geographic detail for the entire U. S. (398)

4. Livestock Water Use.

This report, prepared by SCS, provides livestock water use estimates and problem severity locations and descriptions. The objective of this report is to provide a tabulation of current (1975) and future (1985 and 2000) numerical volumetric estimates of livestock consumptive water use (annual and monthly) in the 106 ASA's. (399)

5. Agricultural Resource Assessment System (ARAS).

USDA provided most of the input to ARAS. Agricultural projections were generated utilizing a combination of the ERS-NIRAP Simulation System and the Iowa State University Linear Programming (LP) Model. The National Science Foundation helped fund the LP Model activity. The ARAS Technical Committee, by its assumptions and constraints, specified alternative futures. The ERS and SCS were the USDA agencies most deeply involved in this activity. (400)

6. Upstream Flooding.

Upstream floods cause \$1,064 million (1967 dollars) average annual damage. Damages, areas inundated, and communities with a flooding problem were inventoried (using existing data) and damages projected. SCS and Forest Service were involved primarily in this effort. (401)

7. National Forests.

Consumptive water uses on National Forests that are comparable and complementary to that on other public lands, and problem areas and issues on National Forests were prepared by the Forest Service. (402)

8. OBERS Projections.

The WRC has published a set of national, regional and area economic projections to be used in making projections of economic impacts of proposed or potential water resource developments. The set of OBERS projections which is the baseline for planning includes those designated as Series E for all sectors of the economy except for agricultural and forestry production. These are designated as Series E' and published in a supplemental document. These supplemental projections are necessary because major modifications have occurred in the international trade area affecting exports; domestic consumption patterns have shifted; and yield trends of some crops have changed. As a result of these significant changes, the ERS has generated a set of agricultural projections based on Series E population estimates but utilizing more recent information (1950-1972) regarding trends in the above described variables. (403) These modified projections are presented in "Series E' Population Supplement, Agricultural Projections, Volume 1, 3 and 4," prepared by USDA, ERS Natural Resources Economics Division, May 1975 .

The basic Series E OBERS projections were prepared for the WRC by the Bureau of Economic Analysis, Department of Commerce, and the ERS, USDA, with assistance from the Forest Service. (404)

Development of Water Resource Plans

Framework, river basin, and single-purpose interagency studies are discussed in Chapter 6 of this publication, and the level of USDA involvement is discussed in detail.

Under the leadership of W. Don Maughan, who became Director of WRC in March 1970, a new planning policy was adopted. Its objectives are (1) to establish levels instead of types of planning; (2) to upgrade Federal, state and local coordination and communication; and (3) to strengthen study management for each study by placing authority and responsibility in a single individual who reports to the Council or a river basin commission. Under the new policy, planning is divided into three levels. (405)

Level A, Framework Studies and Assessments, seeks to combine the Type I Studies with the National Assessment process. The framework

studies are to be continuously reappraised and revised. They are expected to contribute to the National Assessment, which is a continuing process. (406)

Level B, Regional or River Basin Plans, will be prepared to resolve complex, long-range problems identified by framework studies and the National Assessment. Their scope and detail are expected to vary widely. They will be used only where an intermediate step is needed between framework and implementation level studies. (407)

Level C, implementation studies, are to be undertaken by a single Federal, state or local entity for authorization and plan implementation. (408)

Central management brought about a proposal for central funding of all WRC planning efforts. From a management standpoint, this proposal had merit. However, from an agency standpoint, it generated problems. Under such an arrangement a manager could use or cut off agency personnel as he saw fit. But agencies would have a problem maintaining adequate qualified personnel available under such an arrangement. Agencies usually have to budget personnel for a specific period and have difficulty adjusting assignments to limited periods. Consequently, the central funding proposal was not readily acceptable to agencies with high levels of commitment to the planning program. (409)

Grants to States

Title III of the Act sets forth a program of grants to states. It is administered by the WRC. The grants are for the purpose of building up the expertise of the states in water resource planning. Using state expenditures in FY 1965 for water and related land resource planning as a base, Federal grants could be used to provide up to 50 percent of state augmented expenditures in the field. USDA participated in the development of a formula to apportion available funds to states requesting assistance. It also participates in the annual allocation recommendations.

Principles and Standards for Planning Water and Related Land Resources

Section 103 of P.L. 89-80 directs the Council to establish ".... principles and standards and procedures for Federal participants in the preparation of comprehensive regional or river basin plans and for the formulation and evaluation of Federal water and related land resource projects".

In 1968 the Council began its work on a set of Principles and Standards, using a special task force. A preliminary report, or first draft, was issued in May 1969. A series of hearings were held in July, August, and September of that year. These were followed by a series of field tests

involving 10 water resource projects of the SCS, Corps of Engineers, and Bureau of Reclamation. The tests were concluded in April 1970. In December 1971, the Council published its proposed Principles and Standards in the Federal Register and established a period of public review. (410)

Following publication, three public hearings were held. The Council received 11,832 comments on 23 issues from 4,782 respondents. The public record is 8,500 pages long. The Council prepared a 320 page "Summary/Analysis of the Public Response" for distribution to the public and all respondents. (411)(412) USDA made a significant input into this effort. It had membership on the Special Task Force, the testing teams, and the team which reviewed, analyzed, and took action on the comments received.

Finally, on September 10, 1973, the Council published the Principles and Standards as approved by the President in the Federal Register. These became effective October 25, 1973, and replaced the policies established by Senate Document 97 which had provided planning guidance since 1962. Of basic interest to USDA are the new planning objectives, the system of accounts, discount rates, plan formulation procedures, and the grandfather clause. (413)

1. Planning Objectives

Plans for the use of the nation's water and land resources will be directed to improvement of the quality of life through contributions to the objectives of national economic development and environmental quality. These objectives are to be considered coequal in the plan formulation process. The national economic development objective is to enhance national economic development by increasing the value of the nation's output of goods and services and improving national economic efficiency. The environmental quality objective is to enhance the quality of the environment through management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems. (414)

2. System of Accounts

The Principles and Standards provide for development of four accounts during the planning process: the National Economic Development account, the Environmental Quality account, the Regional Development account, and the Social Well-Being account. The purpose of these accounts is to display the beneficial and adverse effects of each alternative plan. They provide a basis for comparing alternative plans and determining the effects of trade-offs between plans. Both monetary and nonmonetary effects must be revealed in the accounts. The use of these accounts requires a complex and rigorous planning effort and more planning time. (415)

3. Discount Rate

In December 1968, the Council had adopted a new discount formula. This formula was based on the yield rate of long-term government certificates

rather than the coupon rate. The Principles and Standards state the discount rate will be established in accordance with the cost of Federal borrowing. This would increase the rate substantially. The rate set for 1973 was $6\frac{7}{8}$ percent. The rate was to be raised or lowered by one-half of one percent increments annually if the actual cost of Federal borrowing changed by more than one-quarter of one percent. (416)

In actual practice the 1968 formula was retained. However, discount rates have continued to increase and for 1978 are set at $6\frac{5}{8}$ percent. This contrasts with a rate of $2\frac{1}{2}$ percent prior to 1961 and $3\frac{1}{4}$ percent prior to October 15, 1968. (417) The higher discount rates favor projects with lower capital investments, higher operations and maintenance costs, and benefits which accrue immediately or in the near future. (418)

4. Plan Formulation

Under the Principles and Standards plan formulation is relatively complex. One alternative plan is formulated which will optimize the national economic development objective. Another is formulated which emphasizes contributions to the environmental quality objective. Usually one or more additional plans are formulated which reflect significant physical, technological, legal or public policy constraints or significant trade-offs between national economic development and environmental quality objectives. With this information at hand, the decision makers make a final selection of a plan which most nearly satisfies the desire of the greatest number of people with direct interests. Such a procedure significantly lengthens the time required to develop a plan and increases the man-hour inputs of planners. (419)

In order to achieve greater uniformity in formulation of the alternative plan for national economic development, it was necessary to issue a guideline for Agricultural Price Standards. In the past some agencies had used current prices to estimate project benefits, some had used current normalized prices and some adjusted normalized prices. An adjustment period of as much as 11 years had been used in establishing adjusted normalized prices. To achieve more realistic prices and to obtain more uniform acceptance, a new formula was developed. These prices are developed for the Council from weighted averages of actual seasonal average prices over a five-year period by ERS. For continued validity a new set of current normalized prices must be developed each year. (420)

5. Grandfather Clause

In order to reduce the cost and impact of immediate and full implementation of the Principles and Standards a phase-in procedure was adopted. Initially, plans transmitted to the Office of Management and Budget between October 30 and December 31, 1973, required only a review to ensure a favorable benefit-cost ratio under the proposed $6\frac{7}{8}$ percent discount rate. (421) This proposed discount rate, however, was not permitted to stand and other problems arose with the provisions of the Grandfather Clause. Finally, on February 12, 1975, Federal Register Notice, Volume 40, Number 30, issued

the specific provisions for full implementation of the Principles and Standards. Plans submitted to OMB between October 23, 1973, and June 30, 1974, required only an addendum showing benefit-cost ratios using the appropriate discount rate. Plans submitted between July 1, 1974, and June 30, 1975, had to be accompanied by an abbreviated Environmental Quality Plan and reflect the appropriate discount rate. At that time agencies were permitted to prepare a list of partially completed plans which they expected to complete and submit to OMB between July 1, 1975, and July 1, 1976. The list was to be submitted to the Council on Environmental Quality. These plans also would have to have an abbreviated Environmental Quality Plan. Any plans not on that list and all future plans are required to comply fully with the provisions of the Principles and Standards.

These compliance requirements throughout the adjustment period added significantly to the planning costs and work loads at the field as well as the Washington level.

National Water Commission Report

The National Water Commission Report, "Water Policies for the Future", was presented to the President and Congress on June 14, 1973. The report was prepared in accordance with the provisions of P.L. 90-515, September 26, 1968, which established the Commission. It contains 579 pages and 232 recommendations along with a number of conclusions. More than 50 of these recommendations are covered by the Principles and Standards. Others are closely related. Among others, it recommended that identifiable beneficiaries bear the full costs of all development for flood control and drainage and repay all costs for irrigation development. (422)

The report also recommends that the Department of Agriculture no longer perform the engineering functions required under P.L. 83-566. In Chapter 15 it recommends that economic development benefits of water projects accruing only to one region be considered as regional benefits. In Chapter 3 it rejected the need for new water programs to respond to potential population growth in rural areas. (423)

USDA did not participate directly in the National Water Commission study. It did, however, review and comment on many of the reports prepared by consultants on specific subject areas, which formed much of the basis for sections of the report. Also, as a member of WRC, USDA reviewed and commented on the draft report of the Commission.

The National Conference on Water

Because of the importance of water to the national economy, the Water Resources Council sponsored a National Conference on Water which was held in Washington, D. C., April 22-24, 1975. The objectives of the conference were to (1) examine the role of water in national affairs through 1985; and (2) to consider the adequacy of existing and proposed policies

and programs in fulfilling this role. (424)

Prior to the conference, the designated vice moderators and secretaries prepared formal discussion papers to help participants focus on the discussions. These papers were prepared with inputs from the Conference Steering Committee composed of representatives of the WRC member agencies. The Steering Committee solicited names of individuals from public and private sources nationwide for use in selection of panelists, respondents, and discussants. At the panel sessions these participants made formal presentations on assigned issues and sub-issues within the purview of their respective panels. (425)

The Conference was made up of eight panels. USDA was responsible for Panel 2, Water and Food and Fiber. It prepared the Panel Issue Paper for this panel; selected and obtained commitments from the participants; assisted them as needed; monitored the discussions; prepared summary statements and cleared these with the panelists; and assisted in the preparation of the final report. Also, the Secretary of Agriculture made one of the four Opening Plenary Statements.

The Second National Conference on Water was held in St. Louis, Missouri, May 23-25, 1977. The WRC decided to have less Federal input and visibility in this conference than in the first. It engaged consultants to plan and take care of the details of this conference. Attendance was about 500 as compared to more than 900 at the first conference.

This conference was especially important as an initial emphasis to President Carter's Water Resource Policy. Secretary of the Interior Andrus made a major address at the conference on the formulation of this policy. The conference underscored that there continue to be conflicts of opinion on the approach to the use and management of water resources. Social values associated with water management, the roles that different levels of government should play, and cost sharing were among the major unresolved conflicts discussed.

Assistant Secretary of Agriculture M. Rupert Cutler appeared on the program the first day of the conference. His contribution was about the only direct input USDA made to this conference, other than in the initial planning stage as a member of the WRC.

Section 80(c) Study

Section 80(c) of the Water Resources Development Act of 1974, P.L. 93-251, directed the President to make a full and complete investigation and study of principles and standards for planning and evaluating water and related resources projects. The scope of the investigation and study was to be three-fold: (1) planning objectives to be included in Federally financed water and related resources projects; (2) the interest rate formula to be used in evaluating and discounting future benefits for such projects; (3) appropriate Federal and non-Federal cost sharing for such

projects. The planning objectives to be considered were defined as regional economic development, quality of total environment including its protection and improvement, the well-being of the people of the United States, and national economic development. (426)

President Ford, in his letter of September 23, 1974, to the Chairman, WRC, assigned responsibility for conducting this study to the WRC. A plan of study was approved by the WRC on January 30, 1975. This set the stage for initiation of the study on February 1, 1975. The plan of study set forth a four-step procedure. The first step was to summarize the current situation in Federal and Federally assisted water resource programs. The second step was to develop and analyze policy options in each of the three study-issue areas and to identify their impact on water resources projects. Third, the policy options would be combined and evaluated as "policy option packages" for appropriate water resources programs. Fourth, preliminary conclusions would be presented to highlight the major alternative options for planning, evaluating and cost-sharing water and related resource projects and programs. (427)

A Study Manager was appointed by and was responsible to the WRC members. A Study Management Team was drawn from the participating Federal agencies. Its job was to assist the Study Manager and to provide guidance to him on day-to-day policy matters. The WRC members themselves retained responsibility for making policy recommendations to the President. (428)

The scope of this job was enormous. There were 7 departments with 18 separate agencies and 7 independent agencies involved in aspects of planning, implementing and operating, maintaining and rehabilitating Federal and Federally assisted water and related land programs and projects. These activities were financed through 70 different appropriation accounts. (429) The study was carried out by the Study Management Team (10 members), the Professional Study Team Staff (9 members with 5 research and secretarial assistants), and 56 professionals from the concerned agencies, with the assistance of 10 university and other advisors and reviewers. (430)

The Report consists of 22 volumes organized into 8 parts. It was completed and furnished to the Council of Members in November 1975.

USDA was a full-time participant in this study effort. It had a member on the Study Management Team and provided 10 professionals to work on various committees and other activities. It also furnished housing for the Professional Study Team Staff.

Water Policy Review

The U. S. has never had a unified water policy. The lack of such a policy was one of the underlying factors which generated the holding of the first National Conference on Water. President Carter has been concerned about this problem. In his Environmental Message to Congress on May 23, 1977, he announced that he had directed the Secretary of the Interior, as

chairman of the Water Resources Council, together with the Office of Management and Budget and the Council on Environmental Quality, to conduct a comprehensive review of Federal water resources policy. (431)

This review was to be completed in six months and lead to the establishment of a "national resources management policy in consultation with Congress and the public". The direction of the study was to be such as would provide incentives and make adjustments that would act to encourage or require conservation of water and efficiency in its use. A Policy Committee was established to guide the study. It is composed of Guy Martin, Assistant Secretary, USDI, representing WRC, Eliot Cutler, Associate Director, OMB, and Gus Speth, Member, CEQ. Eight regional hearings were scheduled to obtain public participation and viewpoints. Hearings were held on July 28-29, 1977, in Minneapolis, Denver, Boston, Atlanta, and Los Angeles, and on August 1-2 in Seattle, Dallas, and Cincinnati. (432)

To facilitate the presentation of comments and ideas at the Hearings, four papers were published in the July 15, 1977, issue of the Federal Register (Vol. 42, No. 136). These papers dealt with the following issues: revision of the planning and evaluation criteria, cost-sharing, institutions, and conservation. The authors of the papers drew heavily on the material developed by the Section 80(c) Study. (See pages 107-108 this chapter.) (433)

Seven task forces were established to develop policy options for each of the following policy areas: (1) water resource planning and evaluation criteria, (2) cost-sharing, (3) institutions and institutional arrangements, (4) Federal reserved water rights, (5) water resources research, (6) water quality, and (7) water conservation. Ad hoc USDA groups participated in all seven task forces. After the public hearings the task forces refined the option papers and sent them to the concerned agencies on December 5, 1977. Agency comments were due by December 20, 1977. As of this writing the Administration has not issued a final water policy statement.

Other Activities

USDA also has participated and continues to participate with the WRC on other activities. Among these have been the Special Task Force on Cost Sharing and the Committee on Organization for Economic Cooperation and Development and Economic Commission of Europe.

CHAPTER 11

WATER CONSERVATION AND WATER QUALITY PROGRAMS

Colorado River Basin Salinity Control Act

One of the newest water resource programs with which USDA has become involved is the salinity control program established by the Colorado River Basin Salinity Control Act, P.L. 93-320, 93d Congress (88 Stat. 268) June 24, 1974. The Secretary of the Interior has leadership and responsibility for this program. However, he is authorized by Congress to utilize the resources of the Secretary of Agriculture to achieve higher on-farm irrigation efficiencies. (434) Further, the Secretary of Agriculture is directed to cooperate with the Secretary of the Interior to effectively carry out the objective of Title II of the Act. (435)

The objective of the Colorado River Basin Salinity Control Act is to "authorize the construction, operation, and maintenance of certain works in the Colorado River Basin to control the salinity of water delivered to users in the United States and Mexico". (436) The Act contains two titles. Title I deals with programs downstream from the Imperial Dam. Title II deals with measures upstream from Imperial Dam.

The necessity to involve USDA in this program is further evidence of the impact of USDA programs, expertise, and delivery systems in the management of the nation's water resources, especially as they affect the nation's agricultural and forest lands. This Chapter is limited to a brief discussion of USDA's studies and contributions toward the objectives of this Program.

On November 27, 1974, the Department of the Interior and the Department of Agriculture entered into a Memorandum of Understanding relative to the Colorado River Basin Salinity Control Act. This memorandum is predicated on the fact that "the Salinity Control Act requires full coordination, cooperation and liaison between Interior and Agriculture in achieving improved irrigation efficiency through research and demonstrations, implementation of on-farm irrigation system improvements, better irrigation management practices, and other activities that would further the objectives of the Salinity Control Act". (437) Also, at the direction of the President, an Advisory Committee on Irrigation Efficiency, with membership from Interior, Agriculture, the Environmental Protection Agency, and the Office of Management and Budget, was established. (438)

The Memorandum provides that Interior shall transfer funds to Agriculture to assist in implementation of provisions in Title I of the Salinity Control Act relating to the improvement of irrigation efficiency in the Wellton-Mohawk Irrigation and Drainage District. (439) It also provides that, under Title II, Interior and Agriculture shall develop and coordinate activities involving improvement of irrigation efficiencies in

the irrigated areas that are sources of salinity in the Colorado River system, and shall jointly plan and implement salinity control measures in the diffuse source areas designated in the Act, using funds appropriated to each agency for such purposes. (440)

The Memorandum also specifies that the Commissioner of Reclamation and the Administrator, SCS, each will designate a salinity control liaison officer to achieve close coordination in carrying out the provisions of the Act. It also provides that the Commissioner and the Administrator, working through and with responsible officials of other agencies of agriculture, shall enter into memorandums of agreement as needed to accomplish the work to be done under Title I and II of the Act. (441) Under this provision, the Administrator and the Commissioner have entered into two working agreements, one for Title I and one for Title II.

1. Memorandum of Agreement for Title I

The Bureau of Reclamation and the Soil Conservation Service entered into a Memorandum of Agreement relating to Title I of P.L. 93-320 on December 2, 1974. This agreement is consistent with the provisions of the Memorandum of Understanding between the Departments of the Interior and Agriculture dated November 27, 1974. It outlines the general procedures to be followed by Reclamation and the Service with respect to cooperative programs designed to achieve improved irrigation efficiencies within the Wellton-Mohawk Irrigation and Drainage District. (442)

The Agreement provides that:

a. Reclamation, in cooperation with the Wellton-Mohawk District, will accelerate the Irrigation Management Service program as authorized by Section 101(f)(i) of the Act. SCS will assist in this activity without reimbursement unless the scope of the assistance requested is beyond that presently being provided.

b. The SCS will be responsible for conducting an accelerated technical and financial assistance program to farmers in the District. Sections 101(h) and 101(k) of the Act provide for installation of on-farm system improvements as a means of increasing irrigation efficiencies. Upon concurrence by Reclamation of the programs conducted by the SCS, funds for the Federal share will be transferred from Reclamation to the SCS. (443)

c. ARS, through the U. S. Salinity Laboratory, will be responsible for conducting an intensified research and demonstration program within the District. A limited amount of the research may be conducted at the University of Arizona, Yuma Mesa and Yuma Valley Experimental Farms, at the U. S. Water Conservation Laboratory, or other appropriate facility. The objective of the research is to obtain early results which will be useful in actual field applications. Available funds for these activities will be transferred from Reclamation to ARS through the SCS. (444)

This cooperative program has been in operation in the Wellton-Mohawk District for over two years. Its rate of progress is about on schedule. The farmers in the District are receiving it well and effectively cooperating in its installation and operation. A high level of on-farm irrigation efficiency, up to 80 percent, is being achieved. The overall system efficiency is being projected at 72 percent. High system efficiencies are necessary if the annual return flows from the Wellton-Mohawk division are to be reduced to 175,000 acre-feet or less as specified in the Act. (445)

2. Memorandum of Agreement for Title II

This working agreement between Reclamation and the SCS became effective March 27, 1975. It outlines the general procedures to be followed by Reclamation and the SCS with respect to cooperative programs designed to control salinity within the Colorado River Basin upstream from Imperial Dam. (446)

Sections 201(a), (b) and (c) of the Act provide for implementing the salinity control policy adopted for the Colorado River, conducting expedited investigations and installing salinity control works through cooperation of the Secretary of Agriculture and the Administrator, Environmental Protection Agency, with the Secretary of the Interior. The primary objective of this cooperative effort is the maintenance of salinity concentrations at or below levels found in the lower main stem of the Colorado River in 1972, while the upper basin continues to develop its compact-apportioned waters. (447)

Section 202(2) directs the Secretary of the Interior to enter into agreements with the Secretary of Agriculture to develop a unified control plan for the Grand Valley Unit, and the Secretary of Agriculture to cooperate in the planning and construction of on-farm system measures under its own programs. Section 203(a)(1) authorizes and directs the Secretary of the Interior to expedite the completion of planning reports on 12 units as described in the Secretary's February 1972 report, "Colorado River Water Quality Improvement Program". Section 203(b)(1) directs the Secretary of the Interior to cooperate with the Secretary of Agriculture in carrying out research and demonstration projects and in implementing on-farm improvements and farm management practices and programs which will further the objective of Title II. (448)

Under the provisions of this Agreement:

a. Reclamation agrees to establish and develop, in cooperation with the SCS and appropriate water user organizations, Irrigation Management Services programs on irrigation source control units identified in the Act. These programs will be integrated with the SCS's activities which are aimed at installation and management of on-farm improvements to attain higher irrigation efficiencies. It also will provide data and information relating to the development of designs for improvement of the irrigation distribution systems. It will coordinate investigations in

the diffuse source units with appropriate agencies to formulate and implement salinity control plans. (449)

b. The SCS agrees to support the IMS programs on the irrigation source units by coordinating technical assistance to water users on water management measures, as provided through ongoing programs, with soil and water conservation districts and providing soil survey data. It will perform a number of activities in compliance with Section 202(2) applicable to the Grand Valley Unit, including: appraisal of irrigation efficiency potential of current on-farm systems and practices; determine on-farm system modification and improvement needs to reduce return flows and salt loading; develop a plan for the needed on-farm improvements including alternative financial plans for implementation; arrange for ARS or other appropriate USDA agencies to conduct research and demonstration projects aimed at improving on-farm irrigation efficiencies and reducing salt loading; provide engineering and other technical assistance for improvement of on-farm systems through available USDA programs; and assist in monitoring and evaluating results of system improvements and practices and prepare necessary reports. (450)

The SCS also will perform a number of activities similar to the above as they pertain to Section 203(b)(1). In addition, it will appraise the salinity accretion emanating from within the diffuse source areas located on private lands and, in cooperation with the Forest Service, on National Forest lands, and participate in the development of coordinated programs for these lands and the adjoining or included National Resource lands in cooperation with appropriate agencies of the Department of the Interior. Also, in cooperation with research and operational entities concerned with water quality conditions, the SCS will undertake a comprehensive evaluation of agricultural water use and erosion as they relate to salinity control within the Colorado River Basin and prepare appropriate reports. (451)

The SCS has completed its report on the Grand Valley Unit. However, no work had been initiated as of September 1977 since no funding had been made available. Progress was being made on plans for three other salt source areas. Altogether, there are five irrigated areas identified for study and about the same number of diffused areas. About that many more areas have been identified that warrant some attention. These investigations of salt source areas by the SCS are being made with River Basin Planning funds.

As a result of its studies, the SCS is giving increased attention to on-farm assistance in its various programs to improve irrigation efficiencies. The GAO has charged all Federal agencies concerned with water utilization in the West to take a better look at their opportunities to improve water use efficiencies. The President has stated that water conservation should be the cornerstone of any new water policy.

The Departments of the Interior and Agriculture and the Environmental Protection Agency have put together a Task Force at the Washington

level to examine this problem and opportunity. These agencies expect to take about one year to analyze the situation and make a report. Interior has the leadership responsibility. However, SCS will chair an interagency study group which will be located in Denver, Colorado, and do the field work.

This interest at the Federal level has stimulated a similar interest among several of the Western States. Active state participation is essential if any program of this type is to be fully effective and long-lasting. Only in this way can the objectives of this Act be fully realized.

Interagency Study on Irrigation Efficiencies

In accordance with General Accounting Office recommendations, an Interagency Task Force on Irrigation Efficiencies has been established at the Washington level. The Task Force membership consists of:

Eugene Hinds, U. S. Department of the Interior - Chairman.

Joseph W. Haas, U. S. Department of Agriculture.

Joseph A. Krivak, U. S. Environmental Protection Agency. (452)

The objective of the Interagency Task Force is to examine the problem of inefficient irrigation in the United States and develop recommendations regarding appropriate Federal objectives, policies, agency roles, and action programs. The Task Force's study will include: requirements for increasing irrigation efficiencies, the costs, economic benefits, water conservation, effects on water quality, and environmental and social impacts. The study will involve both Federal and non-Federal irrigation development. (453)

The Task Force established a Technical Work Group to make investigations, evaluations, and recommendations on ways to improve irrigation efficiencies. The Technical Work Group operates out of the Engineering and Research Center, Bureau of Reclamation, Denver, Colorado. Sheldon G. Boone, SCS, has been designated as Chairman of the Technical Work Group and primary USDA representative. Paul K. Koluvek, SCS, Portland, Oregon, and E. Gordon Kruse, ARS, Fort Collins, Colorado, are also members of the work group. Other USDA agencies will need to participate in some of the work activities. (454) The Departments of the Interior and the Environmental Protection Agency also have a minimum of three representatives serving on the Technical Work Group. (455)

The Technical Work Group is charged with the following tasks:

1. Document the efficiencies of irrigation water conveyance and on-farm irrigation systems using existing data and accuracies as defined by the Technical Work Group.
2. Identify the structural and non-structural measures required to increase farm irrigation efficiencies and the efficiencies of

irrigation water delivery systems.

3. Make realistic appraisals of the feasibility of substantially increasing Western irrigation efficiencies within 5 years and the attainable measure of improvement.

4. Determine the costs, associated water savings, water quality and fish and wildlife impacts and associated mitigation measures required, and social and economic effects of irrigation efficiency improvements.

5. Determine the potential disposition of the water saved and the benefits and environmental impacts associated therewith.

6. Review the current objectives, policies, and ongoing action programs of Federal agencies and other organizations as directly or indirectly concerned with increasing irrigation efficiencies.

7. Identify adjustments needed in Federal objectives and policies and specific actions which should be taken to increase water use efficiencies, achieve water conservation, enhance water quality, and achieve environmental goals.

8. Orient the study to document conclusions and recommendations, keeping the recommendations of the General Accounting Office's reports of June 22, 1977, and September 2, 1977, firmly in mind.

9. The investigations should emphasize agricultural water use in the Western States.

10. Prepare a draft report from the Interagency Task Force to the Secretaries of Agriculture and the Interior and the Administrator of the Environmental Protection Agency presenting the study's findings, conclusions, and recommendations.

11. Prepare the final report from the Interagency Task Force. This report is due September 1, 1978. (456)

Rural Clean Water Program

The Rural Clean Water Program was authorized by Sec. 35, P.L. 95-217 (91 Stat. 1579), December 27, 1977. This legislation amends Section 208, P.L. 92-500, the Federal Water Pollution Control Act. Sec. 35 authorizes and directs the Secretary of Agriculture, with the concurrence of the Administrator, Environmental Protection Agency (EPA), and acting through the Soil Conservation Service and such other USDA agencies as the Secretary may designate, to establish and administer a program for the purpose of installing and maintaining measures incorporating best management practices to control nonpoint source pollution for improved water quality. The program will be carried out through contracts with the owners and

operators of rural land. These contracts, which provide for Federal cost-sharing, will have a duration of not less than five nor more than ten years. (457)

On February 8, 1978, Secretary of Agriculture, Bob Bergland, approved a proposed Organization for Implementing the Rural Clean Water Program. The program organization provides:

1. The Soil Conservation Service has program leadership.
2. There will be a Rural Clean Water Coordinating Committee, chaired by the Administrator, SCS.
3. SCS will develop rules and procedures and manage budgeting, accounting, and reporting. Also, it will provide technical support leadership to states, evaluate program operations, and approve agreements.
4. The Agricultural Stabilization and Conservation Service will provide guidance to State and County ASC Committees and coordinate Agricultural Conservation Programs with Rural Clean Water Programs.
5. The EPA will approve 208 plans and provide concurrence in USDA rules, regulations, and project proposals.
6. Other USDA agencies will be represented on the Committee and will provide support as appropriate.
7. The Administrator, SCS, will enter into agreements with soil conservation districts, state soil and water conservation agencies, and state water quality agencies, where practicable, for administration of the program. These agencies of State Government will be required to submit records of cost-share disbursements to the State ASC Committee and to the State Conservationist, SCS.
8. Where the administrator of contracts is retained by USDA, SCS will enter into cooperative agreements for the transfer of funds to ASCS for allocation to ASC county committees which will make cost-share payments to individuals and provide the associated records and reports. Payments will be made upon certification by the designated SCS technician.
9. The State ASCS will consolidate the annual cost-share disbursements made by the state and local agencies as well as those disbursed by the State ASC Committee.
10. SCS will enter into cooperative agreements with other USDA agencies (Extension, FS, FmHA, ERS, ARS) as appropriate for support which they will provide.
11. There will be a committee to coordinate project determination among the 208 management agencies, soil conservation districts, and other USDA and State-support agencies.
12. SCS will provide technical assistance and prepare and transmit budget requests, progress and other needed reports.
13. ASCS will furnish data on land use, crop history and cost-shared conservation measures for the program; and review plans and contracts to assure coordination with other farm programs.

14. ASC county committees, in those counties selected for participation in the Rural Clean Water Program, will represent the Secretary of Agriculture in determining priority of assistance among individual land owners and operators, together with the local soil conservation district, based on technical information provided by SCS. (458)

A formal agreement on the program design for the Rural Clean Water Program was signed on April 25, 1978, by Assistant Secretary M. Rupert Cutler of USDA and Assistant Administrator Thomas C. Jorling of EPA. This agreement will serve as the basis for the development of National program regulations. Draft regulations are scheduled to be published around May 15, 1978, with a period for public review and comment before final publication prior to September 30, 1978. (459)

CHAPTER 12

S U M M A R Y

The Department of Agriculture was established on May 15, 1862. Its general design and duties were "to acquire and diffuse among the people of the United States useful information on subjects connected with agriculture...., and to procure, propagate, and distribute among the people new and valuable seeds and plants". In the early 1880's it established experimental farms and laboratories in various parts of the country to work on specific agricultural problems. In 1889 the Department began issuing farmer's bulletins as a means of diffusing among the people information about scientific developments in the field of agriculture.

In 1889 the Weather Bureau was transferred to the USDA and, in 1892, it initiated USDA's work on soils by publishing a report on the "Relation of Soil to Climate" and a bulletin on "Some Physical Properties of Soils in Their Relation to Moisture and Crop Distribution". This, apparently, was the first published recognition of soil-moisture relationships.

Engineering studies dealing with irrigation of agricultural crops were authorized by Congress in 1898 and research on drainage was authorized in 1902. This work was transferred from USDA's Office of Experiment Stations to its Office of Public Roads and Rural Engineering in 1915. Eventually, it was transferred to the SCS in 1938.

In 1905 control over the forest reserves was transferred from the Department of the Interior to the USDA. In 1911 the Weeks Act authorized the Secretary of Agriculture to purchase lands necessary to the regulation of flow of navigable streams. In 1920 the Federal Power Commission was formed with USDA as a member. The Federal Water Power Act of 1920 authorized the FPC to license non-Federal development of water power on navigable waters and public lands. In 1925 Congress directed the Corps of Engineers and the FPC to prepare jointly a list of navigable streams and their tributaries on which power development appeared practicable. The list was printed in 1927 in H.D. 308 and reports prepared by the Corps of Engineers on these streams became known as the "308 reports". These reports had a significant influence on the scope of studies made later by USDA.

USDA's early research work also included the hydrology of agricultural watersheds. This research provided the basic concepts and data for use in developing the Rational Formula for estimating maximum run-off from a small agricultural watershed. Its use was essential to the design of water management measures on agricultural lands.

During the period 1862-1929 USDA experienced a major expansion in its areas of responsibility, including research in various fields of water management. The reason for this expansion into the field of water

resources has been appropriately expressed by D. A. Williams, former Administrator, SCS. He stated: "Water, like soil, is a basic resource of the nation's life and economy. And, like soil, its use and care are first in the hands of farmers, ranchers, and other land users." (460) USDA is the Federal Agency charged with the responsibility of assisting the people of the United States with subjects and problems connected with agriculture.

USDA's involvement in the field of water resources accelerated during the next half-century. Its activities in soil and water conservation and erosion control research expanded rapidly in the early 1930's. In April 1935, the Soil Conservation Service was established and all USDA erosion control activities were centered in that agency. After July 1, 1937, all its erosion control work was undertaken through legally constituted Soil Conservation Associations.

USDA was involved in the activities of four successive national planning organizations at the national level between 1933 and 1943. The Flood Control Act of 1936 directed the Secretary of Agriculture to make Federal investigations of watersheds and measures for run-off and water flow retardation on the watersheds of the nation. An amendment to this Act in 1937 extended this authority to cover all watersheds authorized to be surveyed by the Corps of Engineers. This included all the "308" waterways. As of January 1, 1946, USDA had authorizations to make preliminary examinations on 913 watersheds. During the period 1937-1943 it initiated studies on 212 watersheds and completed 160. Eleven of these were authorized for construction by the Flood Control Act of 1944.

USDA prepared an Agricultural Plan for development of the Missouri River Basin to supplement and complement the Pick-Sloan Plan of the Corps and the Bureau of Reclamation. It was not authorized for construction but influenced subsequent watershed planning efforts. Other USDA water programs of the late 1930's and early 1940's were the Water Facilities Program, the Land Utilization and Retirement of Submarginal Land Program and the Case-Wheeler Program.

The 1953 House Agricultural Appropriations Bill included \$5 million for a pilot watershed program. This was authorized and 62 watersheds were designated by December 8, 1953. Planned works of improvement were installed on 54 of these by 1972.

The Flood Prevention Watersheds authorized by the Flood Control Act of 1944 and the Pilot Watersheds Program were the forerunners of the Watershed Protection and Flood Prevention Program authorized by P.L. 83-566. This has been a very popular program because it is locally initiated, locally controlled, and reflects the objectives and desires of the local people. As of April 1, 1977, 2,860 applications for assistance had been received, and 1,752 watersheds approved for planning, 1,185 plans authorized for operations and 434 projects had been completed.

This program has encountered a number of problems which have delayed installation and slowed down the rate of planning during the last 10 years: (1) The Administration placed a moratorium on the processing

of Watershed Work Plans in 1966. This was not lifted until April 1, 1969, by the new Administration. About 96 watershed projects were held in abeyance during this period. (2) The National Environmental Policy Act was passed in 1969. It required environmental impact statements to be prepared for each project. At the time the Act was passed, SCS had 621 watershed projects in operation. Since the Act was ruled to be retroactive, each of these had to be brought into compliance. This required much of the available planning resources. (3) The Uniform Relocation Assistance and Real Property Policies Act also required additional planning inputs into projects already in operation. (4) New emphasis on the protection of archeological and historical properties added a new dimension and additional time requirements to the planning process. (5) The Water Resource Council issued its Principles and Standards in 1973. These replaced the planning and evaluation procedure established by Senate Document 97 and required a multiple-objective planning approach with equal emphasis on national economic development and environmental quality. This not only increased investigation and evaluation time in order to service its four accounts, but also made plan formulation more difficult because of involvement of added interests.

The impact of these changes and added requirements to the planning process are: planning is a more involved and longer process than formerly; a wider range of interests is involved; and the decisions and desires of the watershed sponsors and residents no longer are over riding. This has changed the watershed program from a local program with Federal assistance to one which approaches a Federal program with local assistance and obligations. The result has been some loss of popularity of the program with the agricultural interests of the watersheds.

The watersheds operations program has moved forward about as fast as available funding would permit. During the 20-year period, 1956-1976, USDA obligated over \$1,221 million on 1,185 projects, 434 of which have been completed.

Through fiscal year 1977, USDA had completed 59 Type 4 cooperative River Basin Studies and had 50 under way. It had participated in 12 Type 1 Interagency Studies, 16 Type 2 studies and 15 Level B studies, 12 of which are still underway.

SCS also makes Flood Hazard Analyses and Flood Insurance Studies. Its field delivery system is especially important to these study efforts. It has an active recreation program which cuts across all SCS programs, and it carries out emergency watershed protection activities following major natural disasters.

Several USDA agencies have water resource programs over and above the Watershed Protection, Flood Prevention, and River Basin Programs. These are ARS, ASCS, ERS, FmHA, FS, and SCS. These programs are discussed briefly in Chapter 8.

USDA has been active in and affected by the interagency coordination activities of the Federal government. Its greatest involvement

has been with the Water Resources Council established by the Water Resources Planning Act of 1965. USDA is an active member of the Council of Members and its alternates, the Council of Representatives, all committees, and the River Basin Commissions. It participates on various task forces including those for the National Assessment, the Principles and Standards, and the Section 80(c) Study.

Because of its field delivery system and its close tie with the farmer, USDA is participating with Interior and EPA in the Colorado River Basin Salinity Control Program. USDA's primary involvement is with the on-farm application of needed corrective measures to improve irrigation efficiencies.

In accordance with recommendations of the GAO, an Interagency Task Force on Irrigation Efficiencies has been established at the Washington level. It is composed of representatives of the USDI, USDA, and EPA. Its objective is to examine the problem of inefficient irrigation in the U.S. and develop recommendations regarding appropriate Federal objectives, policies, agency roles, and action programs.

The Task Force established a Technical Work Group to make investigations, evaluations and recommendations on ways to improve irrigation efficiencies. It operates out of Denver, Colorado, and is chaired by SCS.

The overall objective of this total effort is water conservation through improved irrigation efficiencies.

The Rural Clean Water Program was authorized by Sec. 35, P.L. 95-217, December 27, 1977. This legislation amends Section 208, P.L. 92-500, the Federal Water Pollution Control Act. The Secretary of Agriculture is authorized and directed to establish and administer a program for the purpose of installing and maintaining measures incorporating best management practices on rural lands to control nonpoint source pollution for improved water quality. The program will be carried out through contracts with the owners and operators of rural lands. These contracts, which provide for Federal cost-sharing, will have a duration of not less than five nor more than ten years.

The SCS has been given program leadership. The ASCS will provide guidance to State and county ASC Committees, coordinate the ACP with the Rural Clean Water Program, and consolidate the annual cost-share disbursements made by State and local agencies as well as those disbursed by the State ASC Committee.

Other USDA agencies, such as Extension, FS, FmHA, ERS and ARS, will provide appropriate support.

SCS will develop rules and procedures; manage budgeting, accounting, and reporting; and provide technical support leadership to states, evaluate program operations, and approve agreements.

The EPA will approve 208 plans and provide concurrence in USDA rules, regulations, and project proposals.

Final publication of the national program regulations are expected prior to September 30, 1978.

As the Water Resource Programs of the nation have developed, USDA has had to be directly involved. It is the Federal agency most closely associated with the farmers, ranchers, and private timber growers who control most of the privately owned lands of the nation. These non-Federal rural lands, together with the National Forests, constitute about 85 percent of the area of the 48 contiguous states. (461) Most of the manageable renewable water resources of the nation originate on these lands.

The evolution of the USDA from essentially an agency concerned only with crop and livestock production to one of the four major water and related land resource planning and construction agencies of the Federal government didn't "just happen". Conditions and resource interrelationships required it. The continued active participation of USDA in water resource programs appears to be essential if a productive, efficient, permanent agricultural economy is to be maintained on many of the most potentially productive areas of the nation.

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